

THE ROLE OF EMPLOYEES WORK ENGAGEMENT IN LINKING ORGANIZATIONAL DYNAMICS AND BUSINESS PERFORMANCE IN ENGINEERING CONSULTING: A MEDIATION FRAMEWORK

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Abstract

This study examines how organizational resources jointly influence consulting performance in knowledge-intensive professional service firms. Despite growing interest in organizational resources, limited empirical evidence exists on their integrated effects and underlying mechanisms in knowledge-intensive professional service firms, particularly within emerging economy contexts such as China's engineering consulting industry. Drawing on the Job Demands–Resources (JD–R) model, we develop an integrated framework that incorporates caring human resource management (CHRM), transformational leadership (TL), and work–life balance (WLB). Using a three-wave time-lagged design with data from 370 engineering consulting professionals in Southwest China, structural equation modeling (SEM) was employed to test the proposed relationships. The results indicate that all three organizational resources significantly enhance consulting performance both directly and indirectly through work engagement (WE), with transformational leadership showing the strongest direct effect. This study contributes to the literature by highlighting the complementary roles of multiple organizational resources and clarifying the dual pathways—direct functional and indirect motivational—through which resources influence performance. Practically, the findings suggest that professional service firms should adopt an integrated resource management approach to improve employee performance. The findings also provide empirical evidence from an emerging economy, contributing to the broader human resource management literature.

Keywords: organizational resources; consulting performance; work engagement; transformational leadership; human resource management; work–life balance.

1. INTRODUCTION

Within the knowledge-intensive landscape of professional service firms, human capital functions as the primary engine for sustainable competitive advantage (Hatch and Schultz, 2004). Organizational performance increasingly depends on the effective management and utilization of human resources in knowledge-intensive work environments (Di Fabio, 2017; Stankevičiūtė and Savanevičienė, 2018). In the engineering consulting sector, where project cycles are long and technical complexity is high, this regeneration is not merely a moral choice but a strategic necessity. As noted in recent studies published in Sustainability, human resource management practices can help reduce burnout and support employee effectiveness in high-pressure work environments (Moustafa et al., 2024). By focusing on consultants' long-term well-being, firms may better sustain the effective use of intellectual capital over time. As the engineering consulting industry faces rising cognitive demands and shifting performance baselines (Griffin et al., 2007), the intensive cognitive demands placed on professionals require organizational support systems that facilitate effective task performance (Boxall, 2003; Kundi et al., 2022). While these challenges are global, they are acutely

manifested in emerging regional hubs undergoing rapid urbanization. A prime example is Southwest China, where rapid infrastructure transformation has intensified the strain on practitioners (Pinto et al., 2022).

Despite the steady proliferation of research, three significant gaps persist. First, most studies examine organizational resources in isolation, overlooking how multiple resources jointly influence employee performance in complex work environments. HRM practices, transformational leadership, and work–life balance are often treated as independent constructs, rather than as an integrated system of organizational resources (Boxall, 2003). However, in professional service environments like engineering consulting, employees do not perceive these resources independently; rather, they form a holistic perception of organizational support. There is a lack of integrated research examining how different types of organizational resources interact to shape performance outcomes (Haque et al., 2021).

Second, the mechanisms through which organizational resources influence performance remain unclear. While prior research suggests that job resources enhance work engagement, emerging evidence indicates that organizational resources may also exert direct functional effects on task performance, beyond their influence through psychological states (Schaufeli et al., 2006; Bakker and Demerouti, 2017). In cognitively demanding consulting environments, the relative importance of motivational (engagement-based) and direct functional pathways remains insufficiently understood. A more granular investigation is required to determine whether resources influence performance primarily through enhancing employee engagement or through directly facilitating task execution (Kundi et al., 2022).

Finally, existing research provides limited evidence from knowledge-intensive sectors in emerging economies. Most studies are based on Western contexts, with limited attention to emerging market settings such as China (Tsui, 2004). The Chinese engineering consulting sector is characterized by high project intensity and hierarchical organizational structures. These contextual characteristics highlight the need to examine how organizational resources influence performance within this specific setting.

To better capture these issues, it is necessary to conceptualize organizational resources in an integrated manner. In this study, organizational resources are conceptualized as a set of supportive conditions provided by the organization that facilitate employees' ability to perform effectively. Drawing on the Job Demands–Resources (JD–R) model, these resources refer to structural, relational, and boundary-spanning factors that help employees achieve work goals and enhance performance. Specifically, this study focuses on three types of organizational resources that are particularly relevant in knowledge-intensive professional service firms: caring human resource management (CHRM), transformational leadership (TL), and work–life balance (WLB).

To address these gaps, this study develops an integrated framework to examine how organizational resources influence consulting performance, drawing on the Job Demands–Resources (JD–R) model (Bakker and Demerouti, 2007). Specifically, it examines how caring human resource management (CHRM), transformational leadership (TL), and work–life balance (WLB) jointly influences consulting performance through work engagement (WE).

Based on a sample of 370 engineering consulting professionals in Southwest China, this study offers three main contributions. First, it contributes to the literature by adopting a multi-resource perspective, demonstrating that organizational resources operate as a complementary system in shaping consulting performance. Second, it clarifies the dual pathways—direct functional and indirect motivational—through which organizational resources influence consulting performance (Nawaz et al., 2024). Third, the findings provide practical implications for improving consultant performance and organizational effectiveness in engineering consulting firms. By integrating institutional, interpersonal, and structural dimensions, this study provides a holistic approach to managing organizational dynamics in professional service firms.

2. LITERATURE REVIEW

2.1 Theoretical Foundations: The Job Demands–Resources (JD–R) Theory

The theoretical framework for this study is grounded in the Job Demands–Resources (JD–R) theory (Demerouti et al., 2001; Bakker and Demerouti, 2017). Over the past two decades, the JD–R model has evolved into a widely used framework for analyzing occupational well-being and performance in complex organizational settings. The central tenet of the theory posits that all job characteristics can be classified into two specific categories: job demands and job resources.

Job demands refer to the physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and psychological costs (Bakker and Demerouti, 2017). In the context of engineering consulting, typical demands include technical complexity, strict project deadlines, and client pressure (Kundi et al., 2022; Pinto et al., 2022). Conversely, job resources refer to those aspects of the job that facilitate the achievement of work goals, reducing job demands and the

associated physiological and psychological costs, or stimulating personal growth, learning, and development (Bakker and Leiter, 2010).

The JD-R theory posits two distinct psychological processes:

(1) The Health Impairment Process: High job demands exhaust employees' mental and physical resources, leading to burnout and health problems (Bakker and Demerouti, 2017; Hobfoll et al., 2018).

(2) The Motivational Process: Job resources dictate a motivational potential that induces high WE, leading to positive organizational outcomes such as superior job performance (Schaufeli et al., 2006; Bakker and Demerouti, 2007; Crawford et al., 2010). This study focuses primarily on the motivational process. Recent extensions of the theory emphasize that resources do not merely buffer against stress; they actively initiate a "gain spiral" where the accumulation of structural and interpersonal resources replenishes the psychological energy required for professional excellence (Hobfoll, 1989; Bakker and Leiter, 2010). Consequently, this research applies the JD-R framework to examine how a holistic suite of resources (HRM, TL, and WLB) drives consulting performance (CP).

2.2 Organizational Resources and CP

To operationalize organizational dynamics in the engineering consulting context, this study categorizes resources into three distinct streams based on the JD-R classification: structural resources (CHRM), interpersonal resources (TL), and boundary-spanning resources (WLB). According to the functional proposition of JD-R theory, these resources are not only motivational but also instrumental—they directly facilitate goal attainment by removing obstacles and optimizing the work environment (Bakker and Demerouti, 2017). The following sections develop hypotheses for their direct impact on CP.

From a resource-based perspective, WLB in knowledge-intensive sectors is not merely a peripheral employee benefit but a vital "Restorative Resource" for intellectual capital. In the high-intensity environment of engineering consulting, constant cognitive engagement without boundary protection leads to "Resource Erosion". Within the JD-R framework, we argue that WLB functions as a protective boundary that prevents the spillover of job demands into the personal domain, thereby allowing for the necessary cognitive recovery. This restoration ensures that consultants maintain their problem-solving efficacy, directly contributing to task performance by preserving the practitioner's core productive capacity.

2.2.1 CHRM and CP

CHRM represent an organization's structural investment in employee well-being (Albrecht et al., 2015). Within the logic of the JD-R model, HRM practices function as foundational structural resources that govern the availability of other workplace supports. By providing necessary training and health safeguards, CHRM directly reduces the structural friction and cognitive load associated with job insecurity (Ma et al., 2023). When the organization removes these bureaucratic or existential uncertainties, consultants can allocate more cognitive capacity to complex technical problem-solving rather than navigating organizational obstacles. Beyond the principle of reciprocity, the direct impact of HRM on performance can be explained through the facilitation of goal attainment and the creation of a Gain Spiral (Hobfoll et al., 2018). For consultants facing strict deadlines, institutionalized care—such as health safeguards and transparent career pathways—reduces what we term structural friction. By minimizing bureaucratic anxiety, CHRM allows professionals to channel their finite cognitive energy toward technical excellence rather than organizational survival. This aligns with the Resource-Based View (RBV), suggesting that internal support systems are rare and valuable resources that directly translate into higher task proficiency (Boxall, 2003). Existing empirical evidence in knowledge-intensive sectors indicates that such human-centric systems directly enhance technical output quality by optimizing the deployment of human capital (Combs et al., 2006; Kundi et al., 2022). Furthermore, in a high-power distance culture, such institutionalized Caring HRM serves as a crucial top-down signal of organizational protection. It mitigates the inherent psychological insecurity of professionals within rigid hierarchies, allowing them to focus on technical excellence rather than navigating hierarchical complexities.

H1: CHRM have a positive effect on CP.

2.2.2 WLB and CP

WLB is conceptualized as a boundary-spanning resource that enables professionals to manage the interface between work and private domains. In the JD-R framework, WLB exerts a functional impact on performance through the mechanism of resource restoration (Sonnetag and Fritz, 2015).

Engineering consulting involves high-intensity cognitive work that rapidly depletes mental energy. This cognitive strain is further intensified by the "schedule-driven" logic prevalent in China's engineering sector, where rigid project timelines frequently push consultants to their psychological limits. Under such conditions, WLB functions as a critical boundary-protection mechanism that prevents the exhaustion of high-intelligence human capital. Without adequate recovery, cognitive control processes deteriorate, leading to errors and reduced task proficiency. WLB initiatives function as a recovery mechanism that allows for the replenishment of psychophysiological resources (Sonnetag and

Fritz, 2015). The boundary-spanning nature of WLB is critical because it facilitates Psychological Detachment. In the always-on environment of engineering consulting, the inability to disconnect from work leads to Cognitive Residue, where thoughts of incomplete tasks interfere with recovery. Initiatives that respect boundary protection function as a Restorative Resource, enabling consultants to return to work with replenished vigor (Sonnetag et al., 2022). Without this boundary, intellectual capital is subject to Human Resource Erosion, which contradicts the principles of social sustainability. When consultants are not preoccupied with unresolved domestic conflicts, they demonstrate higher levels of concentration and efficiency during work hours. Thus, WLB directly contributes to performance by ensuring that the consultant operates at an optimal cognitive capacity (Haar et al., 2019; Vaziri et al., 2020).

H2: WLB has a positive effect on CP.

2.2.3 Transformational Leadership (TL) and CP

Transformational Leadership (TL) is characterized by idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. In the project-based environment of engineering consulting, TL functions as a critical 'Relational Resource' that enables 'Resource Buffering'. Particularly in the high-power distance culture of China's engineering sector, transformational leaders effectively soften rigid hierarchical barriers by fostering a climate of psychological safety. This ensures that professional insights are channeled into high-quality project delivery rather than being suppressed by organizational ambiguity.

Transformational leadership in project-based environments encompasses both technical guidance (initiating structure) and individualized consideration (transformational behavior). In the JD-R framework, leaders act as resource gatekeepers who directly facilitate task completion (Nawaz et al., 2024). Leaders influence performance not just directly, but also by acting as resource crafters who optimize the job characteristics for their subordinates (Tummers and Bakker, 2021).

Effective leaders clarify goals, streamline decision-making processes, and provide immediate feedback, which reduces the ambiguity inherent in complex engineering projects. By optimizing the allocation of team resources and providing intellectual stimulation, transformational leaders directly enhance the efficiency of the workflow. This functional support allows consultants to navigate technical uncertainties more effectively, leading to superior project delivery and client satisfaction irrespective of the employee's motivational state (Dong and Zhong, 2021). Transformational Leadership in this context functions as a crucial Relational Resource. Transformational leaders do not merely monitor tasks; they engage in resource buffering by clarifying ambiguous goals and providing intellectual stimulation that reduces the consultant's cognitive load. From the perspective of Social Exchange Theory (Blalock Jr and Hansen, 1968), when leaders provide this high-level functional support, it creates a sense of obligation and psychological safety. Moreover, transformational leadership effectively 'softens' the rigid barriers of high-power distance by fostering a climate of psychological safety. This allows consultants to communicate technical risks and complex solutions openly, ensuring that critical professional insights are not suppressed by hierarchical constraints during high-stakes project phases. This high-quality exchange mitigates the Role Overload common in engineering consulting, ensuring that professional expertise is channeled into high-quality project delivery rather than wasted on navigating organizational ambiguity (Breevaart et al., 2016).

H3: TL has a positive effect on CP.

2.3 WE and CP

WE is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli et al., 2002). Vigor involves high levels of energy and mental resilience while working. Dedication refers to being strongly involved in one's work and experiencing a sense of significance and enthusiasm. Absorption is characterized by being fully concentrated and happily engrossed in one's work. Within the JD-R framework, engagement is the primary predictor of performance. Engaged consultants differ from others because they proactively mobilize their own resources (job crafting) and are better able to cope with job demands (Bakker and Demerouti, 2017). Empirical studies consistently demonstrate that the psychological focus inherent in absorption allows for deep work and innovative problem-solving, which are prerequisites for high performance in engineering consulting (Christian et al., 2011; Mazzetti et al., 2023).

H4: WE has a direct positive effect on CP.

2.4 The Mediating Role of WE

Grounded in the motivational process of JD-R theory, this study posits that WE serves as the central psychological conduit through which organizational resources are translated into professional excellence. According to Bakker and Demerouti (Bakker and Leiter, 2010), job resources possess an intrinsic motivational potential. When organizations provide CHRM and Transformational Leadership, they fulfill basic psychological needs for autonomy and competence. This fulfillment fosters a persistent, positive affective-cognitive state (engagement), which in turn drives consultants to invest discretionary effort into their roles (Schaufeli et al., 2006). This fulfillment, as delineated by Self-

Determination Theory (SDT), transforms external support into a State of Flow, where the consultant's absorption in work is driven by an internalized professional ethos rather than mere compliance (Christian et al., 2011). Consequently, in high-stakes consulting, this engaged state acts as a strategic catalyst that converts latent organizational resources into observable professional excellence, thereby bridging the functional gap between institutionalized care and sustainable performance.

Similarly, WLB prevents the depletion of the energy reservoir required for dedication. When consultants perceive that their non-work life is respected, they reciprocate with higher levels of vigor and absorption during work hours (Ipsen et al., 2021). Meta-analytic evidence confirms that while resources provide the potential for performance, engagement is the psychological bridge that unlocks this potential (Crawford et al., 2010; Knight et al., 2017). Therefore, we argue that the provision of resources initiates a motivational gain spiral, leading to the actual execution of complex consulting tasks.

H5: WE mediates the relationship between CHRM and CP.

H6: WE mediates the relationship between WLB and CP.

H7: WE mediates the relationship between TL and CP.

As conceptualized in the study's framework, HRM, TL, and WLB form an integrated system of resources that enhance CP both directly (functional pathway) and indirectly through WE (motivational pathway). This dual-pathway mechanism represents the core theoretical model of the present study (see Figure 1).

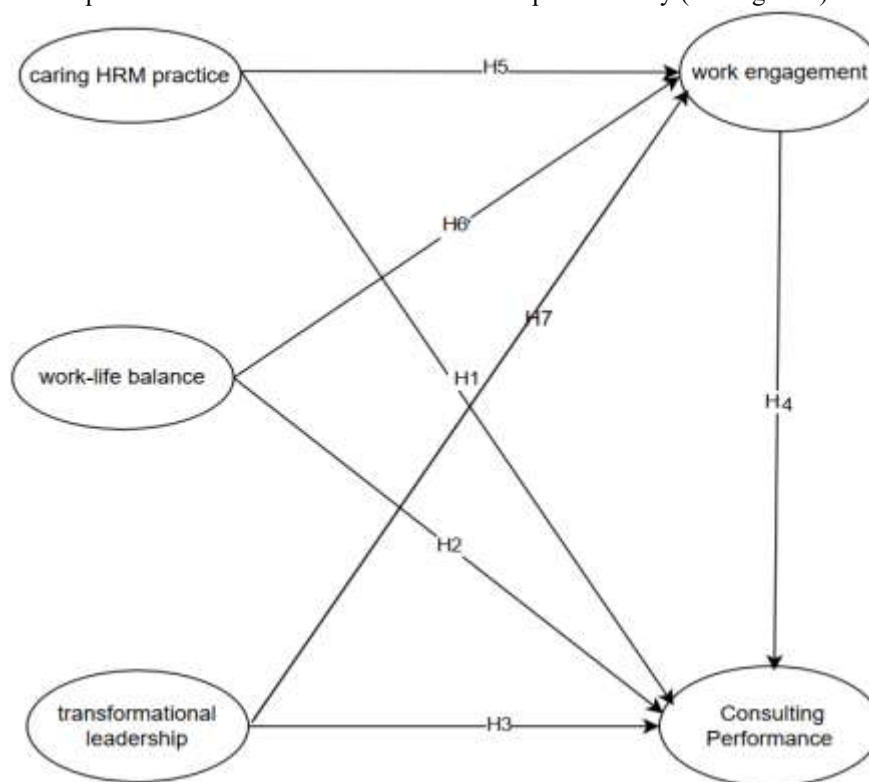


Figure 1. Research Framework

3. RESEARCH METHODOLOGY

3.1 Sample and Procedure

Research Context: Data were collected from August to November 2025 from professional consultants employed in several representative engineering consulting firms in Southwest China. This region was strategically selected as the sampling context due to its unique high-demand organizational environment. Driven by China's Western Development Strategy and the construction of the New International Land-Sea Trade Corridor, this region is experiencing a surge in large-scale infrastructure projects. Furthermore, the region's complex geological topography imposes exceptional technical challenges and strict deadlines. This combination creates a naturally high-pressure setting, making it an ideal setting to examine the theoretical mechanisms of the Job Demands-Resources (JD-R) model.

Design and Procedure: To minimize common method variance (CMV) and facilitate causal inference, this study employed a three-wave time-lagged design (Mitchell and James, 2001). A criterion-based purposive sampling strategy was implemented, restricting participation to full-time professionals in core technical or advisory roles. This approach captured a comprehensive view of the organizational climate across varying seniority levels, from junior staff to senior experts.

To minimize respondent fatigue and ensure data quality, the survey was administered in three distinct phases, with a two-week interval between each phase: Phase 1 (T1) Collected demographic data and the independent variables (CHRM, WLB, TL). A total of 550 questionnaires were distributed; Phase 2 (T2) Distributed two weeks later to the same respondents, measuring the mediating variables (WE). Phase 3 (T3) Distributed two weeks after T2, focusing on the dependent variable (CP).

Data were collected via a hybrid approach utilizing both onsite paper-and-pencil questionnaires and online surveys. To facilitate cross-temporal matching while protecting anonymity, participants generated a unique code (e.g., last 4 digits of phone number + birth year) at each wave. Following the three-wave collection, a strict data cleaning process was implemented to exclude incomplete responses or pattern-matching. This resulted in a final sample of 370 valid paired responses ($N=370$), with a retention rate of approximately 67.2%. To ensure the validity of our longitudinal findings, an attrition analysis was conducted. Results indicated no significant differences in demographic variables (gender, age, and education) between the final sample and those who dropped out after the first or second wave ($p > 0.05$). This confirms that the data is free from systematic non-response bias, a critical requirement for establishing stable causal inferences in three-wave designs (Podsakoff et al., 2003).

3.2 Measures

All constructs were measured using established scales drawn from prior literature, with contextual adaptation where necessary to reflect the engineering consulting setting. To ensure linguistic and conceptual equivalence in the Chinese context, all English scales underwent a standard translation-back-translation procedure (Brislin, 1970). Items were rated on a 5-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").

3.2.1 CHRM

To measure CHRM, this study employed a 16-item scale developed on the basis of prior literature and adapted to the engineering consulting context. Following Strohmeier (2013), CHRM was conceptualized as an institutionalized form of organizational care reflected in formal HR-related practices. More broadly, HRM is commonly understood as a multidimensional and practice-based construct rather than a single isolated policy. Accordingly, CHRM was not treated here as one narrowly defined HR intervention, but as a broader configuration of HR practices through which organizational care is institutionalized and perceived by employees.

To enhance contextual relevance, the final 16-item scale covered four domains that are particularly salient in engineering consulting: training and development, participation in decision making, flexible work arrangements, and health and safety. Training and development as well as participation in decision making (8 items) were adapted from Delery and Doty (1996), reflecting the organization's support for employee growth and involvement. Flexible work arrangements (4 items) were based on Hayman (2009), with refinements made to reflect the project-based and partially remote nature of consulting work. In addition, health and safety items (4 items) were incorporated to capture the protective dimension of organizational care, particularly in relation to the operational demands and potential on-site risks associated with engineering consulting. From this perspective, these four domains can be understood as complementary manifestations of organizational care in the engineering consulting context.

Sample items include "My supervisor frequently invites me to participate in decision-making" and "I feel that I can apply for flexible work schedules when needed." Conceptually, CHRM was treated as an overarching reflective construct capturing employees' overall perception of institutionalized care through developmental support, participative practices, flexibility support, and health-safety protection. This domain-based adaptation was adopted to improve content validity in the engineering consulting context, where organizational care is expressed through multiple, interrelated HR practices. In this study, Cronbach's α is 0.914.

3.2.2 WLB

Work-Life Balance was assessed using a 16-item scale primarily adapted from Greenhaus et al. (2003), with contextual refinement to reflect the characteristics of engineering consulting work. The scale was designed to capture employees' perceived ability to maintain balance between work and non-work domains. Consistent with the original conceptualization, the instrument included items relating to work-family conflict (reverse-coded), participation in leisure, and satisfaction with family time.

To reflect the digitalization and project-based coordination that increasingly characterize engineering consulting, remote-work-related items were also incorporated, drawing on Grant et al. (2013). These items were not intended to redefine WLB as a telework construct or a separate standalone dimension. Rather, they were retained because, in

engineering consulting, remote and flexible work arrangements shape employees' ability to manage boundaries between work and non-work roles. In this sense, such items functioned as context-specific indicators associated with employees' perceived ability to maintain work–life balance under digitally enabled and project-based working conditions.

Given the prevalence of project-based scheduling, client responsiveness, and digitally mediated coordination in engineering consulting, this contextual adaptation was adopted to improve the content relevance of the WLB measure for the target population. Thus, the synthesized scale captures both traditional role balance and contemporary flexibility-related conditions that may support employees' perceived work–life balance. Sample items include "I feel capable of balancing the demands of both work and family" and "My employer is flexible in allowing me to work remotely."

In this study, Cronbach's α is 0.912.

3.2.3 TL

Assessed using 16 items adapted from the Multifactor Leadership Questionnaire (MLQ) (Bass, 1990). Grounded in Transformational Leadership theory, this scale captures four key dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Sample items include "My leader articulates a compelling vision of the future".

In this study, Cronbach's α is 0.939.

3.2.4 WE

Assessed using the widely cited Utrecht WE Scale (UWES-9) (Schaufeli et al., 2006). The scale comprises 9 items covering three psychological states: Vigor (high energy), Dedication (strong involvement), and Absorption (full concentration). Sample items include "When faced with complex engineering consulting projects, I feel energized and motivated to solve problems."

In this study, Cronbach's α is 0.932.

3.2.5 CP

Measured using the work role performance scale by Griffin. This 12-item scale is specifically designed for uncertain work environments and focuses on three dimensions: Individual Task Proficiency, Individual Task Adaptivity, and Individual Task Proactivity. Sample items include "I am able to quickly adjust my approach to meet requirements when project demands or client expectations change" and "I proactively suggest new consulting methods or improvements to enhance project outcomes."

In this study, Cronbach's α is 0.920.

3.3 Data Analysis Strategy

The data analysis followed a rigorous two-stage structural equation modeling (SEM) approach as suggested by Anderson and Gerbing [46], utilizing SPSS 26.0 and AMOS 24.0.

In the first stage, a confirmatory factor analysis (CFA) was performed to assess the measurement model's reliability and validity. In the second stage, the structural model was estimated to test the proposed hypotheses. To evaluate the overall model fit, multiple indices were employed, including χ^2/df , CFI, TLI, RMSEA, and SRMR, based on the recommended thresholds (Hu and Bentler, 1999; Hair et al., 2019).

Furthermore, to minimize potential common method variance (CMV) and strengthen causal inference, this study employed a three-wave time-lagged data collection design with a two-week interval between each wave. Following the procedural recommendations of Podsakoff et al. (2003) the variables were temporally separated: independent variables were measured at Time 1, mediators at Time 2, and dependent variables at Time 3. Additionally, Harman's single-factor test was performed as a statistical remedy. The results indicated that no single factor accounted for the majority of the variance, confirming that CMV does not significantly bias the findings.

Preliminary analyses indicated that the results remained consistent regardless of whether control variables were included, with all hypothesized relationships being supported in both scenarios. Consequently, to enhance model parsimony and mitigate potential interpretational biases associated with the inclusion of non-significant controls (Bakker and Demerouti, 2007), we report the results without control variables in the subsequent sections.

4. RESULTS

4.1 Measurement Model Assessment

Because some measures were contextually adapted for the engineering consulting setting, confirmatory factor analysis was conducted to further assess construct validity. As shown in Table 1, the measurement model demonstrated high reliability and convergent validity. Specifically, all Cronbach's α and composite reliability (CR) values were well above the 0.70 threshold, indicating strong internal consistency. In addition, all average variance extracted (AVE)

values exceeded the 0.50 benchmark, and all item loadings were significant and above 0.70, providing evidence of adequate convergent validity) (Fornell and Larcker, 1981; Hair et al., 2019).

Table 1. Measurement model reliability and validity

Variables	Cronbach's α	CR	AVE
CHRM	0.914	0.825	0.542
WLB	0.912	0.817	0.530
TL	0.939	0.851	0.592
WE	0.932	0.875	0.701
CP	0.920	0.828	0.617

4.2 Common Method Variance (CMV)

To ensure the robustness of the findings, this study addressed potential CMV through both procedural and statistical remedies.

First, a three-wave time-lagged design was employed with a two-week interval between each wave to provide temporal separation among the variables.

Second, Harman's single-factor test was conducted. The results showed that the first factor accounted for 34.2% of the variance, which is well below the 50% threshold, suggesting that no single factor dominated the data.

Third, to further validate these results, a more rigorous Unobserved Latent Method Construct (ULMC) approach was applied following Liang et al. (2007). A common method factor was added to the measurement model. As shown in Table 2, the inclusion of the latent method factor did not significantly improve the model fit ($\Delta CFI = -0.002$, $\Delta TLI = -0.002$, $\Delta IFI = -0.002$, $\Delta RMSEA = 0.000$, $\Delta CMIN/DF = 0.018$).

Table 2. Comparison of fit indices between the baseline model and the ULMC model.

Fit Indices	Baseline Model	ULMC Model	Difference ($\Delta =$ ULMC – Baseline)
CFI	0.910	0.908	-0.002
TLI	0.906	0.904	-0.002
IFI	0.910	0.908	-0.002
RMSEA	0.046	0.046	0.000
CMIN/DF	1.766	1.784	0.018

4.3 Descriptive Statistics and Correlations

Table 3 presents the means, standard deviations, and Pearson correlation coefficients for all study variables. As anticipated, the core constructs exhibited significant positive correlations in the hypothesized directions. Specifically, CHRM, WLB, and TL—were positively associated with both WE ($r = 0.50, 0.49, 0.52, p < 0.01$) and CP ($r = 0.49, 0.56, 0.61; p < 0.01$). These bivariate relationships provide preliminary support for the study's hypotheses. Furthermore, discriminant validity was confirmed using the Fornell–Larcker criterion. As shown in the diagonal of Table 3, the square root of the Average Variance Extracted (AVE) for each construct (ranging from 0.728 to 0.837) exceeded the inter-construct correlations (maximum $r = 0.608$), indicating that the constructs are empirically distinct.

Table 3. Descriptive Statistics and Correlation Matrix

Variables	Mean	SD	1	2	3	4	5
CHRM	3.53	0.87	(0.736)				

WLB	3.53	0.89	.364**	(0.728)			
TL	3.44	1.00	.415**	.534**	(0.769)		
WE	3.39	1.06	.501**	.491**	.522**	(0.837)	
CP	3.49	0.90	.486**	.562**	.608**	.579**	(0.785)

Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). Note: N = 370. Diagonal elements (in parentheses) represent the square roots of the Average Variance Extracted (AVE); off-diagonal elements represent the correlations between constructs

4.4 Structural Model Fit

As shown in Table 4, these indices meet the recommended criteria for a good model fit (Hair et al., 2019). The results indicate an acceptable overall fit: The CMIN/DF ratio is 1.766 (4,336.096/2,456), which is well below the upper-limit criterion of 3. Although the chi-square test is significant ($p < 0.001$), this is expected due to the large sample size and does not indicate model misspecification.

All incremental fit indices meet or exceed the 0.90 benchmark: IFI = 0.910, TLI = 0.906, and CFI = 0.910 demonstrating that the hypothesized model fits the data significantly better than the null model. Furthermore, the RMSEA = 0.046 falls below the recommended cut-off of 0.05, and the SRMR = 0.046 is within the acceptable range (< 0.08).

Table 4 Model Fit Tests

Fit Indices	CMIN	DF	CMIN/DF	p	IFI	CFI	TLI	RMSEA	SRMR
Structural Model	4336.096	2456	1.766	< 0.001	0.910	0.910	0.906	0.046	0.046

4.5 Hypotheses Testing

Following the confirmation of the measurement model, the structural model was estimated using AMOS 24.0 with maximum likelihood estimation to test the proposed research hypotheses. To ensure the robustness of the results, particularly for the indirect effects, a bootstrapping procedure with 5,000 resamples was employed to generate 95% bias-corrected confidence intervals (BC CI). The standardized path coefficients and the overall structural relationships are graphically illustrated in Figure 2, while the comprehensive statistical results—including standardized path coefficients (β), 95% confidence intervals, and significance levels—are summarized in Table 5. As detailed in the following sections, the empirical evidence provides strong support for the hypothesized Resource–Engagement–Performance (R-E-P) framework.

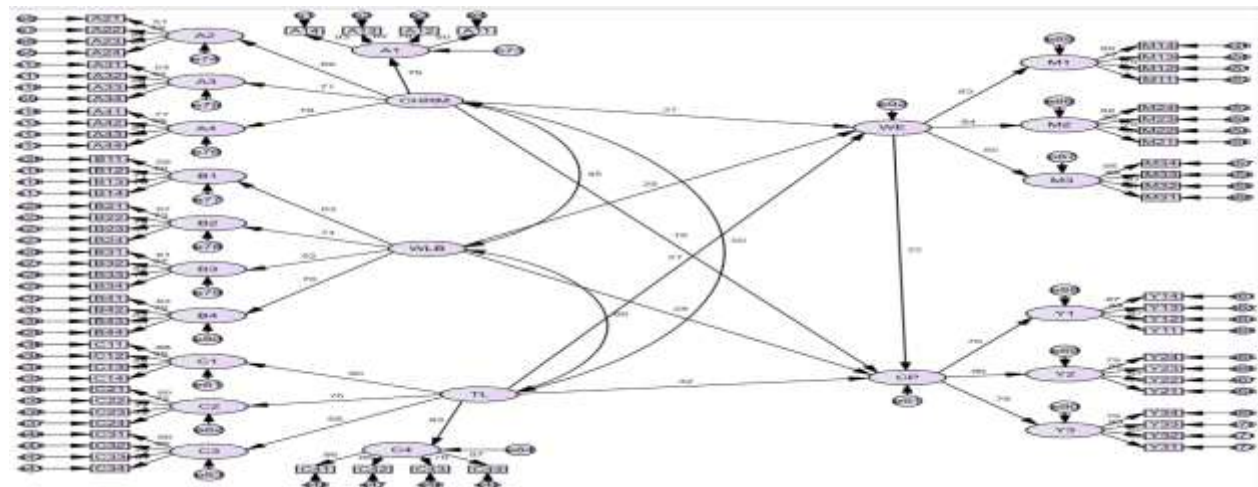


Figure 2. Standardized Path Coefficients of the Structural Model

Table 5. Summary of Hypothesis Testing

Hyp.	Path	β	p	95% CI	Result
H1	CHRM $\rightarrow$ CP	0.19**	0.001	[0.023, 0.343]	Supported
H2	WLB $\rightarrow$ CP	0.28**	0.001	[0.117, 0.461]	Supported
H3	TL $\rightarrow$ CP	0.32**	0.002	[0.157, 0.515]	Supported
H4	WE $\rightarrow$ CP	0.22**	0.010	[0.059, 0.397]	Supported
H5	CHRM $\rightarrow$ WE $\rightarrow$ CP	0.08**	0.007	[0.024, 0.179]	Supported
H6	WLB $\rightarrow$ WE $\rightarrow$ CP	0.050*	0.012	[0.009, 0.140]	Supported
H7	TL $\rightarrow$ WE $\rightarrow$ CP	0.060**	0.005	[0.014, 0.144]	Supported

Note: N = 370; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Two-tailed tests. BC = Bias-corrected; CI = Confidence Interval. As shown in Figure 2 and Table 5, the results supported all the proposed hypotheses.

4.5.1 Evaluation of Direct Effects (H1–H4)

The empirical results provide strong support for the direct influence of organizational resources on CP. First, regarding Hypothesis H1, CHRM were found to have a significant positive direct effect on CP ($\beta=0.19$, $p=0.001$, 95% CI [0.023, 0.343]), suggesting that institutionalized support systems facilitate task execution.

Second, in support of Hypothesis H2, WLB demonstrated a robust positive impact on performance ($\beta=0.28$, $p=0.001$, 95% CI [0.117, 0.461]), highlighting the importance of boundary protection.

Furthermore, Hypothesis H3 examined the role of TL, which exhibited the strongest direct influence among the three predictors ($\beta=0.32$, $p=0.002$, 95% CI [0.157, 0.515]). These results suggest that transformational leaders may help reduce technical uncertainty and support task completion more directly in complex project environments. These findings validate those organizational resources directly enhance professional outputs in high-pressure consulting environments.

Additionally, the relationship between the mediator and the outcome was assessed. Hypothesis H4 proposed that WE would positively drive CP. The path analysis confirmed a significant positive relationship ($\beta=0.22$, $p=0.010$, 95% CI [0.059, 0.397]), indicating that higher work engagement is associated with better consulting performance, thus supporting H4.

4.5.2 Evaluation of Mediation Effects (H5–H7)

To further explore the "motivational pathway" of the JD–R model, this study examined the mediating role of WE. Hypothesis H5 stated that WE mediates the link between CHRM and CP. The mediation analysis revealed a significant indirect effect ($\beta=0.08$, $p=0.007$, 95%CI [0.024, 0.179]). Given that the direct effect remained significant, WE serves as a partial mediator in this relationship.

Similarly, Hypothesis H6 was supported, as WLB was found to enhance CP via the mediating mechanism of WE ($\beta=0.05$, $p=0.012$, 95%CI [0.009, 0.140]), suggesting that work–life balance may support performance partly by sustaining employees' engagement.

Finally, Hypothesis H7 predicted that TL would influence CP through WE. The results confirmed this indirect pathway ($\beta=0.06$, $p=0.005$, 95%CI [0.014, 0.144]). This mediating pathway suggests that transformational leaders may improve consulting performance not only by supporting task completion but also by enhancing employees' work engagement. In summary, the support for H5–H7 indicates that WE serve as an important mechanism linking organizational resources to consulting performance.

5. DISCUSSION

The findings of this research extend existing examinations of job resources by providing a more integrated understanding of professional performance in high-stakes environments.

While prior JD–R research often treats resources as independent predictors, our results suggest that in knowledge-intensive sectors such as engineering consulting, different types of organizational resources operate in an interconnected manner (Boxall, 2003; Bakker and Demerouti, 2007). The relatively strong role of TL suggests that in project-based environments, interpersonal resources may play an important coordinating role alongside structural resources (Bass, 1990). Our findings suggest that organizational resources are better understood as complementary rather than independent in shaping performance outcomes. This finding suggests that, in high-stakes professional

services, performance depends not only on task demands but also on the preservation of cognitive and boundary-spanning resources.

Furthermore, this study provides a nuanced refinement of the dual-pathway mechanism through which resources are translated into professional outputs. A common assumption in JD–R research is that resources influence performance mainly through engagement (Crawford et al., 2010; Bakker and Demerouti, 2017). The findings also indicate that organizational resources may influence performance through both direct functional effects and indirect motivational pathways via work engagement (Hobfoll, 1989). This finding suggests that boundary management may support task performance not only through engagement but also more directly. This suggests that for cognitively taxed professionals, resources such as WLB may support recovery in addition to enhancing engagement (Vaziri et al., 2020). This distinction between the motivational role of TL and HRM and the functional role of WLB adds a critical layer of granularity to current performance frameworks.

Finally, the study extends existing management research by situating it within the schedule-driven and high-power-distance context of China’s engineering sector (Tsui, 2004). The findings from Southwest China indicate that the preservation of human capital is also important for maintaining employee performance in high-intensity work environments. By showing that CHRM and WLB may help mitigate the pressures associated with rigid project timelines, the study provides additional evidence for the relevance of well-being-centered management in this context. This context-specific perspective contributes to a broader understanding of how organizational resources support intellectual capital in emerging market settings.

The findings of this study offer several practical implications for professional service firms.

First, CHRM should be viewed not merely as a supplementary benefit, but as an important management practice for supporting employee performance and long-term functioning. Within the knowledge-intensive landscape of engineering consulting, the firm’s primary production assets reside within the cognitive capacity of its professionals. Following the core tenets of the JD–R framework (Bakker and Demerouti, 2007), management should place greater emphasis on employee support and recovery. By institutionalizing supportive HR practices, organizations can reduce structural constraints and enable employees to allocate more cognitive resources to task execution (Di Fabio, 2017). Beyond these structural practices, the findings also highlight the importance of leadership. In China’s high-power distance culture, leaders must act as essential buffers against hierarchical silence. A possible explanation is that psychological safety supports more accurate communication and problem solving. Transformational leaders who provide individualized support can reduce hierarchical barriers and enable subordinates to communicate technical risks more effectively (Bass, 1990). In this context, firms that foster open communication may improve project quality by reducing the risk of errors associated with suppressed expert feedback.

Ultimately, addressing the always-on culture is no longer elective but essential for organizational resilience. Given the industry’s schedule-driven intensity, WLB should be treated as an important management issue rather than merely a peripheral benefit (Greenhaus et al., 2003). Management should recognize that unclear boundaries may reduce recovery and efficiency; thus, enforcing clearer boundary protections may help consultants sustain performance across long project cycles.

While this study provides robust evidence for the R-E-P framework, several methodological and conceptual boundary conditions merit further exploration. Primary among these is the inherent reliance on self-reported data, particularly regarding CP. Although the three-wave time-lagged design employed in this research significantly mitigates common method variance (CMV) by separating the measurement of variables over time [38], self-assessment remains susceptible to social desirability bias. In high-stakes professional environments, practitioners may inadvertently overstate their efficacy to align with rigorous industry expectations. To strengthen the empirical foundation of these findings, future research would benefit from dyadic designs, matching employee self-reports with supervisor evaluations to provide a more objective perspective on professional excellence. Beyond methodological constraints, the sectoral specificity of the sample presents an opportunity for comparative research. The unique project-based nature of engineering consulting creates a professional landscape that might differ from other service industries. Replicating this dual-influence model across diverse geographic and institutional contexts would enhance its external validity (Schaufeli et al., 2006). Furthermore, while WE were identified as a pivotal mediator, the performance mechanism likely involves parallel psychological pathways. Subsequent investigations should explore additional mediators, such as organizational trust, while examining how boundary conditions like project complexity interact with resource availability to provide a more granular understanding of the performance-resource nexus under conditions of environmental uncertainty.

Perhaps the most pressing frontier for future inquiry involves the transformative impact of Artificial Intelligence (AI) and business model innovations. As technological automation begins to reshape the traditional JD–R pathways in

engineering consultancies (Synott and Aksenova, 2025), future research must examine whether AI functions primarily as a Job Resource by alleviating cognitive friction or as a new Job Demand that induces algorithmic anxiety among professionals. Investigating how organizational support systems can buffer the stressors of exponential technological change will be essential for ensuring the long-term sustainability of professional service firms in an increasingly automated landscape.

6. CONCLUSIONS

This study examined the synergistic relationships among CHRM, WLB, TL, WE, and CP within the engineering consulting sector. The results indicate that CHRM, WLB, and TL each contribute positively to consulting performance, both directly and indirectly through work engagement. Furthermore, all three organizational resources demonstrate significant direct positive effects on CP, with TL emerging as the strongest overall driver of professional performance. WE was found to partially mediate the links between these antecedents and CP, confirming the existence of both direct functional and indirect motivational pathways to performance. The structural model demonstrated acceptable fit, providing a robust statistical basis for the hypothesized framework. Overall, these findings suggest that consulting performance is driven by the combined effects of organizational resources, which enhance employee performance both directly and indirectly through work engagement.

Ethical Approval and Informed Consent

This study was conducted in accordance with relevant ethical guidelines and approved by the Academic Ethics Committee (Opinion No. 2025-08; August 2025). Informed consent was obtained from all participants involved in the study.

Conflicts of Interest

All authors declare that they have no conflicts of interest.

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