MOTIVATION FOR THE DEVELOPMENT OF HIGH-QUALITY HUMAN RESOURCES IN VIETNAM'S RAILWAY SECTOR

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Abstract
The motivation for developing high-quality human resources (HQHR) in Vietnam's railway sector is a pressing and essential issue addressed in this study. As a key economic sector with nearly 80 years of history, Vietnam's railway industry has made significant contributions to national socio-economic development. In the era of accelerating the Fourth Industrial Revolution, the sector faces new missions and expectations, requiring improved business efficiency to better serve public transportation needs and support economic growth. Therefore, this research aims to examine the motivational factors driving HQHR development in the railway sector. Data were collected via a structured questionnaire distributed to 400 respondents. The analysis employed moderated regression analysis (MRA) to explore the relationships between variables. The findings reveal that key motivational factors significantly influence business performance and the capacity of human resource development activities. Based on the results, the authors propose several practical solutions to promote the development of HQHR in Vietnam's railway sector.
Keywords: work motivation; labor performance; railway enterprises; digital transformation

1. INTRODUCTION

Amidst the impacts of economic globalization and the knowledge-based economy—especially during the transformative wave of the Fourth Industrial Revolution—Vietnam's economy must inevitably transition from a resource-intensive model to one centered on knowledge, with a focus on developing high-quality human resources (HQHR). Given the current pace of global technological and scientific advancement, it is imperative for Vietnam to accelerate its integration and modernization efforts. Consequently, HQHR has become a central issue in national policy frameworks related to development resources, acting as a decisive factor for economic growth. Investment in human capital, especially HQHR, is essential for achieving prosperity and sustainable development in all nations.

The 13th National Congress of the Communist Party of Vietnam, along with Conclusion No. 49-KL/TW of the Politburo and various transport development strategies, have affirmed that the railway sector is a key investment priority. This includes high-speed north–south railways, urban railways, rail links to seaports, industrial zones, major urban areas, and international rail connections. Railways are uniquely positioned to integrate with other modes of transportation. To realize this potential, a skilled workforce must be established. Universities specializing in transport must establish railway faculties, improve curricula and teaching quality, and invite international experts to provide instruction. The Ministry of Education and Training, in coordination with universities, should select students from core disciplines for further specialized training, both domestically and abroad. Moreover, large railway-related industrial corporations and ecosystems must be established to support long-term sectoral growth.

Strategic breakthroughs in this sector are closely tied to the development of HQHR and the modernization of transportation infrastructure. The Vietnamese railway sector, a specialized economic branch with advanced technical demands, has contributed significantly to national development over nearly 80 years—spanning wartime service and current reforms. According to Point a, Subsection 1, Section 2 of Decision No. 1769/QĐ-TTg (2021), Vietnam currently operates seven railway lines with a total length of approximately 2,440 km, extending from Dong Dang to Ho Chi Minh City. The urban railway system includes a total length of 19.7 km, consisting of a 2.6 km underground section (with three stations) and a 17.1 km elevated section

(with eleven stations). Vietnam Railways has played and continues to play the role of a "backbone" in the national transport system, contributing to socio-economic development and meeting public mobility demands.

However, in recent years, the railway sector has exposed various limitations and shortcomings. It has failed to keep pace with social demands and cannot compete effectively with other transport modes such as roadways, waterways, and low-cost air carriers. Furthermore, the demands of national development in the context of Industry 4.0 have highlighted the sector's inability to leverage its strengths as a leading economic force. Among the multiple causes of this stagnation, the most critical is the lack of a strong and capable workforce—especially a shortage of high-quality human resources capable of supporting Vietnam Railways' restructuring and modernization in the current period.

2. RESEARCH ON MOTIVATION AND THE DEVELOPMENT OF HIGH-QUALITY HUMAN RESOURCES IN THE RAILWAY SECTOR

2.1. Studies on Work Motivation

Numerous international studies have confirmed a positive correlation between work motivation and employee performance, particularly in the railway industry—an area that demands precise coordination, strict safety standards, and operational excellence. For instance, Zhang et al. (2019), using a multivariate regression model with data from 1,000 railway employees in China, found that high motivation levels not only enhanced individual performance but also reduced accident rates and improved service quality [1]. Similarly, Yamamoto et al. (2017) highlighted that highly motivated employees in Japan tend to strictly adhere to safety protocols, thus improving the overall operational efficiency of railway companies [2].

Modern motivational theories also contribute significantly to explaining the mechanisms through which motivation affects performance. Locke & Latham (2002) argued that clearly defined and challenging goals stimulate proactive work behavior [3]. Gagné & Deci (2005) developed Self-Determination Theory, emphasizing the role of intrinsic motivation—autonomy, competence, and relatedness—in enhancing both performance and job satisfaction [4]. Eisenberger et al. (2001) emphasized the significance of perceived organizational support (POS) in strengthening motivation and commitment [5]. Bakker & Demerouti (2007), through the Job Demands–Resources (JD-R) model, proposed that the balance between job demands and available resources is a key determinant for sustaining long-term motivation and performance [6].

Additionally, research by Grant (2008), Ryan et al. (2011), and Luthans et al. (2008) revealed that job meaningfulness, autonomy, and psychological capital (optimism, confidence, and perseverance) are fundamental elements that enhance intrinsic motivation, leading to improved performance [7, 8, 9].

2.2. Studies on High-Quality Human Resources in the Railway Sector

The concept of high-quality human resources (HQHR) has been approached from various theoretical and methodological perspectives. When applied specifically to the railway sector, HQHR is commonly associated with educational background, professional qualifications, working competencies, passion, and dedication. Even in the era of Karl Marx—although the term HQHR was not explicitly used—he acknowledged the significance of individuals with the ability to apply scientific and technological advancements in production. Marx described such individuals as comprehensively developed, technically proficient, and capable of mastering the production system [10].

In their study titled "Quality and Human Resource Management: Lessons from Baldrige Award Companies," Richard Blackburn and Benson Rosen (1993) defined HQHR as individuals with high social awareness and advanced work skills, reflected in effective job performance [11]. Tiona VanDevender (2012) described HQHR as individuals with strong

health, excellent practical skills, and the capacity to meet organizational demands in both the present and the future [12].

In the Vietnamese context, HQHR—particularly in the railway sector—is defined as skilled labor with domain-specific expertise, practical competence, adaptability to rapid technological changes, good health, ethical qualities, and the ability to creatively apply trained knowledge and skills in real-world production processes to achieve high productivity and efficiency [13]. Echoing this viewpoint, the study about "Issues in Developing High-Quality Human Resources in the Era of Industrialization and Modernization," emphasized that HQHR must possess intellectual and technical superiority and the capability to create national competitive advantages [14]. Such individuals can apply scientific and technological advances to expand emerging industries for societal benefit.

Chu Hao asserted that HQHR must be recognized through actual performance rather than academic credentials alone. In other words, HQHR refers to individuals who consistently deliver exceptional results, demonstrate creativity, and make tangible contributions to society. Contemporary studies on HQHR often employ varying terminologies such as "talent," "intellectual workforce," or "expert teams." Notable contributions include Hoang Van Chau (2009) on HQHR development for post-crisis economic integration [15]; Nguyen Van Khanh (2018) on Vietnam's intellectual capital [16]; Tran Van Tung (2005) on training and utilizing talented personnel [17]; Pham Cong Doan (2021) on talent recruitment during digital transformation [18], and Nguyen Huu Cuong (2023) on the intellectual workforce in Vietnamese higher education [19].

2.3. Policies for Sustaining and Enhancing Work Motivation: International Experiences and Lessons for Vietnam

From international practices, it is evident that countries with developed railway sectors prioritize building policies aimed at maintaining and enhancing employee motivation. In Japan, the Kaizen model promotes employee participation in continuous improvement processes while fostering a flexible, safe, and recognized work environment. Lifetime employment policies in several large railway companies also help maintain employee loyalty and long-term commitment.

In Germany, the dual vocational training system allows employees to enhance their competencies and career advancement opportunities. Transparent compensation systems and comprehensive welfare programs play a crucial role in maintaining motivation. Companies in Germany also emphasize work–life balance through flexible working arrangements.

In the United States, companies such as Amtrak adopt performance-based compensation systems and encourage technological innovation with active employee involvement. Flexible work environments—especially post-pandemic—are a cornerstone in their strategy for retaining skilled workers.

For Vietnam, these international experiences suggest the need to develop appropriate policy frameworks that focus on improving welfare schemes, establishing performance-linked compensation mechanisms, and creating clear pathways for career development. Promoting a culture of innovation and encouraging employee engagement in improvement processes are also practical solutions to increase organizational cohesion and work motivation. Additionally, providing flexible working conditions and reducing work-related stress through effective human resource management can significantly improve both employee satisfaction and productivity.

Research by Nguyen Thi Hong Van and Tran Thi Thu Ha shows that in logistics enterprises, work motivation positively influences organizational performance—particularly when employees receive adequate resource support and work in flexible environments [20]. Meanwhile, the study by Nguyen Thi Mai Trang and Nguyen Thi Hong Nhung in the service sector highlights that recognition, development opportunities, and a positive work environment are key factors in enhancing motivation and improving labor performance [21].

Similarly, Le Thi Thu Hang and Nguyen Thi Minh Phuong emphasized the role of a positive corporate culture—especially recognition and support from leadership—in enhancing employee motivation [22]. Tran Thi Thanh Huong and Pham Thi Thu Ha found that work motivation is closely related to job satisfaction, which in turn positively affects performance in small and medium-sized enterprises in Vietnam [23].

Notably, in the context of digital transformation, research by Pham Van Duc and Nguyen Thi Lan Huong indicates that technology brings both opportunities and challenges to work motivation [24]. Employees equipped with digital skills and provided with appropriate training support tend to show higher motivation, whereas those lacking preparation may struggle to adapt, leading to reduced morale.

In summary, both research findings and international experience confirm that maintaining and enhancing work motivation not only improves individual performance but also contributes directly to the organizational effectiveness of enterprises—particularly in the railway sector, which is currently facing significant pressure to innovate and compete.

3. Research Methodology
3.1. Research Design

This study adopts a positivist approach to ensure objectivity, reliability, and the ability to test hypotheses rigorously. To gain a comprehensive understanding of the impact of work motivation on performance and organizational effectiveness in Vietnam's railway enterprises, a mixed-methods design was employed—integrating both qualitative and quantitative techniques.

In the initial qualitative phase, key factors influencing employee motivation in the railway sector were identified through in-depth interviews with representatives from senior leadership, middle management, operational staff, and human resource experts. Thematic analysis was used to extract core themes, which informed the construction of the theoretical framework and the survey instrument.

In the subsequent quantitative phase, hypotheses were tested using a structured questionnaire based on the qualitative findings. A five-point Likert scale was employed. Stratified random sampling was used to ensure representativeness across job levels and geographic regions. Data from 400 railway employees were collected and analyzed using statistical techniques including Exploratory Factor Analysis (EFA), multiple regression, and Structural Equation Modeling (SEM).

3.2. Theoretical Framework

The research framework was constructed based on classical theories of work motivation, including Expectancy Theory [25], the Two-Factor Theory [26], and Self-Determination Theory [27]. In addition, contemporary perspectives were integrated, particularly those addressing motivation in the context of digital transformation and the post-COVID-19 work environment.

For performance and organizational effectiveness, the study draws on Campbell's (1990) job performance theory [28] and the organizational effectiveness model of Richard et al. (2009) [29]. These theories provide a comprehensive basis for analyzing the mediating role of job performance in the relationship between work motivation and organizational outcomes.

Research Model and Hypotheses
- Independent variables: Motivational factors including Expectancy (E), Instrumentality (I), Valence (V), Hygiene factors (H), Motivators (M), Autonomy (A), Competence (C), and Relatedness (R).
- Mediating variable: Job performance (P), measured through productivity, work quality, and contributions to organizational goals.
- Dependent variable: Organizational effectiveness (OE), measured by financial performance, human resource outcomes, and customer satisfaction.

Hypotheses**:**
- H1: Motivation factors (E, I, V, H, M, A, C, R) have a positive impact on job performance (P).
- H2: Job performance (P) positively affects organizational effectiveness (OE).
- H3: Motivation factors indirectly affect organizational effectiveness through job performance.

Regression Equations**:**

$$P = \beta_0 + \beta_1 E + \beta_2 I + \beta_3 V + \beta_4 H + \beta_5 M + \beta_6 A + \beta_7 C + \beta_8 R + \varepsilon_1 \qquad (1)$$
$$OE = \gamma_0 + \gamma_1 P + \varepsilon_3 \qquad (2)$$
$$OE = \gamma_0 + \gamma_1(\beta_0 + \beta_1 E + \cdots + \beta_8 R + \varepsilon_1) + \varepsilon_3 \qquad (3)$$

Data Collection
- Primary data**:** Collected through a survey of 400 employees from railway companies in northern, central, and southern Vietnam, spanning various job roles.
- Secondary data**:** Included financial reports, industry data, and academic literature published in reputable scientific journals.

Survey items used a 5-point Likert scale and were adapted from validated instruments: Hackman & Oldham (1976) for motivation [30], Campbell (1990) for performance [28], and Richard et al. (2009) for organizational effectiveness [29]. A pilot test with 30–50 respondents was conducted to refine the questionnaire.
- Sampling method**:** Stratified random sampling by job position and geographic region.
- Sample size**:** 400 respondents, which meets SEM sample size requirements as recommended by Hair et al. (2010) [31].

3.3. Data Analysis Methods
- Reliability and validity tests**:**
  - Cronbach's Alpha ≥ 0.70 and Composite Reliability ≥ 0.70
  - Convergent validity: AVE ≥ 0.50; CFA factor loadings ≥ 0.70
  - Discriminant validity: Fornell-Larcker criteria and HTMT < 0.85
  - Content validity: Reviewed by HR and railway sector experts
- Exploratory Factor Analysis (EFA)**:** Used to identify the structure of measurement scales.
- Confirmatory Factor Analysis (CFA)**:** Applied to test model fit with indicators such as CFI > 0.90, TLI > 0.90, RMSEA < 0.08.
- Common Method Bias: Controlled using Harman's One-Factor test.
- Structural Equation Modeling (SEM)**:** Used to analyze causal relationships between variables, including both direct and indirect effects.

The generalizability of the study was ensured through representative sampling, the use of both primary and secondary data, and advanced statistical validation techniques.

4. Research Findings and Discussion
4.1. Multiple Regression Results: The Impact of Motivation on Job Performance

Using data from 400 employees in Vietnam's railway sector, multiple regression analysis was conducted with SPSS 26 to examine the influence of motivational factors on job performance. The results are summarized in Table 1.

Table 1. Multiple Regression Results – Job Performance (P)

Variable	Coefficient (β)	SE	p-value	Conclusion
Expectancy (E)	0.32	0.04	<0.001	Significant (H1a)
Instrumentality (I)	0.28	0.05	0.002	Significant (H1b)
Valence (V)	0.25	0.03	0.001	Significant (H1c)

Hygiene Factor (H)	0.18	0.06	0.012	Significant (H1d)
Motivator (M)	0.41	0.04	<0.001	Significant (H1e)
Autonomy (A)	0.35	0.05	<0.001	Significant (H1f)
Competence (C)	0.29	0.03	0.003	Significant (H1g)
Relatedness (R)	0.22	0.04	0.008	Significant (H1h)
Constant (β_0)	1.15	0.12	-	-
R^2	0.67	-	-	Explains 67% variance

(Source**:** Authors' calculations)

Among the motivational factors, *Motivator (M)* had the strongest impact on job performance ($\beta = 0.41$), while *Hygiene Factor (H)* had the weakest influence ($\beta = 0.18$). This reflects the evolving expectations of modern employees, who increasingly value intrinsic motivational elements such as personal growth and meaning in their work over basic maintenance factors.

4.2. Simple Regression Results: The Impact of Job Performance on Organizational Effectiveness

A simple regression analysis using Structural Equation Modeling (SEM) in AMOS 24 was conducted to determine the mediating role of job performance (P) in influencing organizational effectiveness (OE). The results are presented in Table 2.

Table 2. Regression Results – Performance → Organizational Effectiveness

Variable	Coefficient (γ)	SE	p-value	Conclusion
Job Performance (P)	0.58	0.06	<0.001	Significant (H2)
Intercept (γ_0)	0.92	0.15	-	-
R^2	0.49	-	-	Explains 49% variance

Detailed breakdown of H2a–H2c:

Indicator	Coefficient (γ)	p-value
Financial performance	0.52	<0.001
Human resource outcomes	0.47	0.003
Customer satisfaction	0.61	<0.001

Among these, job performance had the strongest impact on customer satisfaction, emphasizing the critical role of human resources in enhancing service experience and organizational outcomes.

4.3. Analysis of Indirect Effects (Mediating Relationships)

Using bootstrapping (400 samples) within the SEM framework, the indirect effects of motivational factors on organizational effectiveness through job performance were calculated by multiplying the path coefficients ($\beta \times \gamma$).

Table 3. Indirect Effects via Job Performance (P)

Factor	$\beta \times \gamma$	95% Confidence Interval	Conclusion
Expectancy (H3a)	0.186	[0.12; 0.25]	Significant (p < 0.01)

Instrumentality (H3b)	0.162	[0.10; 0.22]	Significant
Valence	0.145	[0.08; 0.20]	Significant
Hygiene (H3d)	0.104	[0.02; 0.18]	Not significant
Motivator	0.238	[0.15; 0.32]	Significant (strongest)
Autonomy (H3f)	0.203	[0.12; 0.28]	Significant
Competence (H3g)	0.168	[0.09; 0.24]	Significant
Relatedness (H3h)	0.128	[0.05; 0.20]	Significant

The strongest indirect effect was found for the *Motivator* factor (0.238), reinforcing its primary role in enhancing organizational performance through its impact on job performance.

4.4. Evaluation of the SEM Model
Table 4. Model Fit and Validity Indicators

Indicator	Value	Acceptable Threshold	Conclusion
CFI	0.93	> 0.90	Good fit
TLI	0.91	> 0.90	Good fit
RMSEA	0.06	< 0.08	Good fit
AVE (Motivation)	0.62	> 0.50	Convergent validity
AVE (Performance)	0.59	> 0.50	Convergent validity
AVE (Effectiveness)	0.55	> 0.50	Convergent validity

These results confirm that the SEM model demonstrates good fit and strong construct validity across all latent variables.

4.5. Scale and Model Validation
Reliability: All measurement scales showed strong internal consistency with Cronbach's Alpha values greater than 0.70. For example, the *Motivator* factor demonstrated high reliability ($\alpha = 0.85$, CR = 0.88).
Validity:
- Convergent validity was confirmed with Average Variance Extracted (AVE) values exceeding 0.50 for all constructs.
- Discriminant validity was supported as the square root of the AVE for each construct was greater than its correlations with other constructs.
- Common method bias was assessed using Harman's one-factor test, which revealed that the first factor accounted for less than 50% of the variance, indicating no serious bias.

Explained variance:
- $R^2 = 67\%$ for job performance
- $R^2 = 49\%$ for organizational effectiveness

These results confirm the robustness and appropriateness of the measurement model and support the structural model's explanatory power.

5. Policy Recommendations for Enhancing Work Motivation in the Railway Sector

Based on the quantitative findings and the current legal framework, the study proposes three strategic groups of solutions aimed at improving work motivation and organizational effectiveness in Vietnam's railway sector:

1. Develop a Multi-Level Career Advancement System Based on Digital Skills (β = 0.41)

Legal basis**:** Clause 3, Article 34 – Labor Code 2019

The proposed advancement system includes three tiers:

- Tier 1**:** Digital technical skills (e.g., IoT, AI in operations)
- Tier 2**:** Digital leadership competencies (e.g., project management for digital transformation)
- Tier 3**:** Community contribution (e.g., leading improvement initiatives)

Incentive mechanism**:** Employees attaining these levels will receive a "Digital Railway Expert" certification, linked to a 15–20% salary increase.

2. Implement a "Dual Performance" Policy Linked to Customer Satisfaction (γ = 0.61)

Legal basis: Circular No. 12/2023 – Ministry of Transport, on service quality management

- Introduce an automated SMS feedback system to collect customer responses after each train journey.
- Reward employees for actionable improvement suggestions derived from customer feedback.
- Recognize the top-performing employee each quarter (based on customer satisfaction scores) with the title "Customer Satisfaction Ambassador."

The policy also calls for agile adjustments in human resource training structures, including forecasting labor demand, tailoring educational plans by region and specialization, and closely aligning curricula with market needs and socio-economic development goals.

It is essential to attract and retain talent**,** especially young, high-potential professionals. Best practices from global experience should be adapted to Vietnam's socio-economic conditions to promote high-quality workforce development. The approach should be rooted in traditional cultural values, while also embracing global knowledge. Furthermore**,** societal involvement in workforce development should be mobilized as a critical enabler for successful implementation.

3. Training and Support for Digital Transformation Adaptation

Legal basis: Resolution No. 52-NQ/TW and Article 62 of the Labor Code 2019

Given that *Motivator* (M) has the strongest impact on performance (β = 0.41), and job performance (P) has a strong effect on organizational outcomes (γ = 0.58), while *Competence* (C) also significantly contributes to performance (β = 0.29), **a** mass higher education model should be adopted to scale up HQHR.

This model should combine research-intensive specialized education with community-focused mass training**.** Vietnam must prioritize investment in national universities as a key strategy. Large-scale investments should be paired with effective governance to avoid inefficiency and waste. Rather than spreading resources thin, targeted investments should be made in selected universities to help them become national centers of excellence.

4. Strengthen Regional Linkages in HQHR Development

In addition to internal capacity building, Vietnam must expand international cooperation in training, particularly with regional and global institutions. This cross-border collaboration is essential to developing high-quality human capital capable of competing and thriving in a globally integrated economy.

6. Conclusion

The study titled *"The Impact of Work Motivation on Job Performance and Organizational Effectiveness in the Railway Sector: Managerial Perspectives and Strategic Solutions"* confirms a statistically significant and positive relationship between work motivation, job performance, and organizational effectiveness in the context of Vietnam's railway sector, which is currently under considerable pressure from digital transformation and the post-COVID-19 recovery.

Quantitative analysis revealed that most motivational factors—such as expectancy, instrumentality, reward value, motivators, autonomy, competence, and social relatedness—positively influence job performance. Among these, *Motivator* ($\beta = 0.41$) and *Autonomy* ($\beta = 0.35$) exert the strongest effects, reflecting a growing trend among employees to prioritize personal development and decision-making freedom in the workplace.

Job performance was also identified as a key mediating factor in the relationship between motivation and organizational effectiveness, particularly in terms of customer satisfaction ($\gamma = 0.61$). This underscores the pivotal role of human resources in enhancing service experiences and achieving organizational goals.

In today's rapidly evolving workplace—marked by digital transformation and prolonged disruptions due to the COVID-19 pandemic—the study highlights the rising importance of intrinsic motivators such as recognition, career development, and social connectedness. In contrast, extrinsic maintenance factors like compensation and benefits have comparatively limited long-term effects on performance. These findings signal a critical need for railway enterprises to reform their human resource management strategies to be more flexible, modern, and aligned with emerging employee expectations.

Accordingly, the study proposes three practical and strategic policy groups:

- Establish a multi-tiered career advancement framework based on digital competencies, empowering employees to proactively develop their skills in the digital era and enhance their professional value;
- Implement a "dual performance" policy that links job outcomes with customer satisfaction, to reinforce a service-oriented mindset and improve the quality of public transportation services;
- Expand training and support systems for digital transformation, helping employees overcome technological adoption barriers and sustain long-term motivation.

This research not only contributes to filling a theoretical gap in the literature on labor motivation in Vietnam's railway sector but also offers highly applicable insights for organizational leaders in designing HR strategies, optimizing employee performance, and building sustainable competitive advantages in the digital age.

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