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HUMAN CAPITAL FACTORS AFFECTING THE COMPETITIVE ADVANTAGE OF LOGISTICS SERVICE BUSINESS ORGANIZATIONS A CASE STUDY OF ABC (THAILAND) CO., LTD.

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ABSTRACT

The study investigates the pivotal role of Human Capital (HC) factors in achieving and sustaining Competitive Advantage (CA) within the dynamic logistics service industry, focusing on a major regional player, ABC (Thailand) Co., Ltd. Grounded in the Resource-Based View (RBV), this quantitative research utilizes a survey methodology with a sample of 200 personnel calculated by Taro Yamane's formula, employing a multi-stage sampling method that combined stratified sampling by functional area with systematic random sampling. The study examined four key Human Capital dimensions (education, work experience, training and skill development, and health and well-being), against the firm's overall Competitive Advantage (cost leadership, differentiation, and market focus). Stepwise Multiple Regression analysis revealed that the HC factors collectively account for 70.90% of the variance in CA. Specifically, Health and Well-being ($\beta=0.50$), Training and Skill Development ($\beta=0.39$), and Education ($\beta=0.19$) significantly enhance CA. Crucially, the finding that Work Experience exerts a statistically significant negative influence ($\beta=-0.21$) highlights the risk of knowledge obsolescence and organizational inertia in a fast-paced, technology-driven environment. The research concludes that strategic investment in employee holistic well-being and continuous skill renewal is the critical differentiator for modern logistics firms.

Keywords: human capital factors; competitive advantage; logistics service business



INTRODUCTION

The logistics and supply chain management sector operates at the nexus of global trade, characterized by hyper-competition, rapid technological adoption (e.g., Artificial Intelligence, automation, big data), and inherent operational complexity. In this context, where technological parity is increasingly common and price wars erode margins, the key to sustained superior performance shifts from tangible assets (like warehouses and vehicles) to intangible resources. The Resource-Based View (Wernerfelt, 1984, p. 172) of the firm identifies these intangible assets, particularly Human Capital, as a source of valuable, rare, inimitable, and non-substitutable (VRIN) competitive advantage (Barney, 1991, p. 105).

Human Capital encompasses the collective value derived from an organization's employees in terms of their knowledge, skills, abilities, experience, and health. For a logistics service provider, Human Capital directly translates into the quality of service, efficiency of complex route planning, effectiveness of IT systems management, and resilience in adapting to supply chain disruptions. In the Thai context, the logistics industry faces unique challenges, including a shortage of skilled personnel and increasing regional competition, making the optimization of existing Human Capital a strategic imperative Schultz (1961, p. 1) and Becker (1964, p. 11, 1993, p. 16).

Despite the recognized importance of Human Capital, there is a lack of empirical research that specifically isolates and quantifies the impact of various human capital dimensions on competitive advantage within the contemporary logistics service industry in Thailand. Furthermore, the conventional wisdom that 'more work experience' inherently leads to greater organizational advantage needs critical re-examination in this high-velocity, high-tech sector. This study seeks to bridge this gap by providing a precise, empirical model of the Human Capital-Competitive Advantage relationship at ABC (Thailand) Co., Ltd., a firm operating at the forefront of end-to-end supply chain services.

RESEARCH OBJECTIVES

1. To investigate the current state of personal factors, key human capital factors (education, work experience, training and skill development, and health and well-being), and the Competitive advantage (cost leadership, differentiation value, and market focus) of ABC (Thailand) Co., Ltd.'s personnel.



2. To analyze and quantify the direct influence of the specific human capital factors on the overall competitive advantage of ABC (Thailand) Co., Ltd.

RESEARCH HYPOTHESES

Hypothesis (H1): Human capital factors significantly influence the competitive advantage.

RESEARCH FRAMEWORK

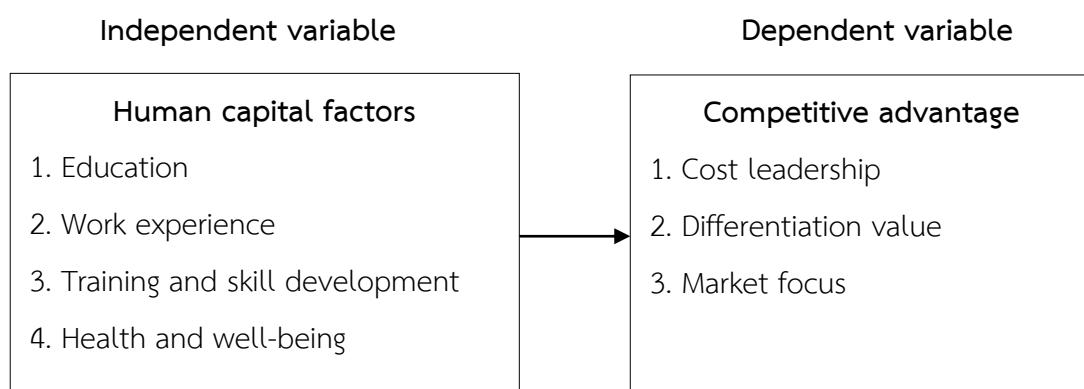


Figure 1. Research framework

RESEARCH METHODOLOGY

Population and sample The target population comprised all employees and managers across the five primary functional areas (e.g., operations, finance, IT, HR) of ABC (Thailand) Co., Ltd. The sample size was calculated using Taro Yamane's formula to ensure statistical representativeness at a 95% confidence level, yielding a required sample of 200 respondents (Yamane, 1967, p. 886). A multi-stage sampling technique was used, combining stratified sampling (by functional area to ensure proportional representation) with systematic random sampling within each stratum.

Research instrument Data were collected by using structured questionnaire developed based on established theoretical constructs. The questionnaire comprised three sections: Part 1: Personal factors of sample (demographic and personal data), Part 2: Measurement of Human capital factors (using items relevant to each of the four dimensions: education, work experience, training and skill development, and health and well-being), and



Part 3: Measurement of competitive advantage (items covering cost leadership, differentiation value, and market focus). Variables were measured using a 5-point Likert scale ranging from 5 (strongly agree/highest level) to 1 (strongly disagree/lowest level). The questionnaire underwent rigorous internal validity checks where content validity was determined by three subject-matter experts using the Index of Item-Objective Congruence (IOC), with values ranging from .67-1, indicating acceptable content validity. Reliability was assessed using Cronbach's alpha coefficient to ensure internal consistency. The results showed a Cronbach's alpha of .97 for the overall questionnaire, .93 for the Human Capital Factors, and .96 for Competitive Advantage, all of which exceed the recommended threshold of .70, demonstrating a high level of reliability.

Data collection The data were collected directly by the researcher using a structured questionnaire as the survey instrument. Prior to distribution, formal permission was obtained from the management of ABC (Thailand) Co., Ltd. The questionnaires were then distributed to the selected sample personnel ($N=200$) through both direct delivery and internal company channels. The fieldwork was conducted across the company's Head Office and four distribution centers located in Lat Krabang, Theparak, the Free Trade Zone, and Bangna during July to September 2025. Before data collection, the researcher explained the study objectives and assured confidentiality,

Data analysis The collected data were processed and analyzed using statistical software.

Descriptive Analysis: Frequency and percentage distributions were used for demographic data. The mean (\bar{X}) and standard deviation (SD) were calculated to determine the central tendency and dispersion of the Human Capital and Competitive Advantage perception levels. The interpretation of mean scores followed the five-level criteria according to Prathum (2024, p. 405): 1.00-1.80 indicated the lowest level, 1.81-2.60 indicated a low level, 2.61-3.40 indicated a moderate level, 3.41-4.20 indicated a high level, and 4.21-5.00 indicated the highest level of importance or opinion.

Inferential Analysis: Stepwise Multiple Regression Analysis was performed to test the predictive power of the four Human Capital factors on the overall Competitive Advantage. The stepwise method was chosen to identify the unique contribution of each variable and determine the most parsimonious model. The significance level was set at $\alpha=.05$.



RESEARCH RESULT

Descriptive analysis The descriptive statistics revealed personal factors regarding the respondents from ABC (Thailand) Co., Ltd. The analysis revealed high average perception scores for both the independent and dependent variables are as follows:

Personal factors The survey of personal factors regarding the respondents from ABC (Thailand) Co., Ltd., was conducted using descriptive statistics (frequency and percentage) to outline the demographic characteristics of the sample group. The findings collectively paint a portrait of a workforce primarily consisting of male employees, who make up 63.00% of the sample, and the majority of whom are single, accounting for 61.50% of respondents. In terms of age, the largest age group is 25–35 years (43.50%) followed by an age group is >35–45 years (34.00%) that reflecting an early working age to middle-age demographic, with over 77.50% falling within the 25–45 years bracket. Corresponding with this demographic profile, the educational background most commonly cited is the vocational certificate/high school level (32.50%), followed by a Bachelor's degree (26.00%). Furthermore, the professional structure of the sample is heavily concentrated at the base, as the vast majority (80.50%) are operational level employees. In contrast, management roles are significantly less represented, with senior management/high-level executives comprising the smallest group (2.00%). Finally, experience levels indicate a generally moderate tenure, as the largest group of respondents (38.50%) reported having worked at ABC (Thailand) Co., Ltd. for 1–3 years. In conclusion, the analysis describes a sample characterized predominantly by young-to-middle-aged, single, male operational staff with vocational or high school level education and relatively short company tenure.

Overall human capital factors ($\bar{X}=3.91$, $SD=0.54$) Indicating that personnel generally perceive the company's Human Capital investment and development to be at a high level. A deeper look at the ranking of each dimension of Human Capital Factors showed: 1) Work experience: ($\bar{X}=4.01$, $SD=0.59$) - Highest perceived level 2) Training and skill development: ($\bar{X}=3.91$, $SD=0.69$) 3) Education: ($\bar{X}=3.87$, $SD=0.64$) and 4) Health and well-being: ($\bar{X}=3.86$, $SD=0.64$) - Lowest perceived level, respectively.

Overall competitive advantage ($\bar{X}=3.75$, $SD=0.64$) Suggests that the firm is perceived as maintaining a strong competitive position. A deeper look at the ranking of each dimension of Competitive advantage showed: 1) Market focus: ($\bar{X}=3.77$, $SD=0.67$) - Highest perceived



strength 2) Differentiation value: ($\bar{X}=3.74$, $SD=0.67$) and 3) Cost leadership: ($\bar{X}=3.72$, $SD=0.70$) - Lowest perceived strength, respectively.

Inferential analysis: stepwise multiple regression analysis

Model validation To ensure reliability, the model underwent validation checks. The Durbin-Watson statistic was 1.800, falling within the acceptable range (1.5-2.5), confirming the residuals were independent and free from autocorrelation. The absence of multicollinearity was verified, with Variance Inflation Factor (VIF) values ranging from 1.778 to 2.576 (well below the threshold of 10) and Tolerance values ranging from 0.381 to 0.562 (above the threshold of 0.10).

The Stepwise Multiple Regression analysis confirmed a statistically significant relationship between the Human Capital factors and Competitive Advantage as shown in Table 1.

Table 1. The relationship between the Human capital factors and Competitive advantage (statistically significant)

Model summary	R	R-Square (R^2)	Adjusted R^2	F Change	Sig. F Change
Final model	0.842	0.709	0.703	118.690	<.001

Table 1: The final model, incorporating all four Human Capital factors, was highly significant (Sig. F Change<.001) as linearity relationship. The R^2 value of 0.709 indicates that the four Human capital factors (education, work experience, training and skill development, and health and well-being) collectively explain 70.90% ($R^2=0.709$) of the variance in the overall Competitive Advantage of ABC (Thailand) Co., Ltd.

Detailed regression coefficients The standardized beta coefficients (β) revealed the specific predictive power and direction of influence for each factor as shown in Table 2:



Table 2. The regression coefficients revealed the specific predictive power and direction of influence for each factor (statistically significant)

Independent variable	Unstandardized coefficient (B)	Std. Error	Standardized coefficient (β)	t	p
(constant)	0.52	0.18		2.78	.00
Health and well-being	0.50	0.06	0.50	8.12	<.00
Training and skill development	0.36	0.05	0.39	6.33	<.00
Education	0.19	0.05	0.19	3.83	<.00
Work experience	-0.23	0.05	-0.21	-4.03	<.00

$R=.842$ d, $R^2=.709$, Adjusted $R^2=.703$, $F=118.690$, Sig of $F=< .001$, Durbin-Watson=1.800, $p<.05$

Table 2: The resulting regression equation, in terms of unstandardized coefficients, is: Competitive advantage =0.52+0.50 (Health)+0.36 (Training)+0.19 (Education)-0.23 (Experience)

Key findings interpretation

1. Health and well-being emerged as the strongest predictor of Competitive Advantage ($\beta=0.50$). This result emphasizes that in a high-pressure, 24/7 logistics environment, a physically and mentally resilient workforce is the primary driver of operational continuity and error reduction.

2. Training and skill development followed as the second strongest factor ($\beta=0.39$), highlighting that continuous, targeted development is essential for employees to master new logistics technologies and maintain operational agility.

3. Education was confirmed as a significant positive factor ($\beta=0.19$), reinforcing the necessity of a strong academic foundation to support complex decision-making and the adoption of advanced supply chain concepts.

4. Work experience exhibited a statistically significant negative influence on Competitive Advantage ($\beta=-0.21$). This critical finding implies that long tenure without corresponding reskilling can lead to technological obsolescence and organizational inertia. This "paradox of experience" aligns with trends observed by Santa, Ferrer, Tegethoff & Scavarda (2022, p. 15) and Korry, Armanu, Sudjatno & Wijayanti (2024, p. 18), who noted that



experience alone does not guarantee advantage if it leads to resistance to change or reliance on outdated practices.

DISCUSSION

The dominance of holistic human capital

The study's findings decisively support the Resource-Based View, confirming that Human Capital factors are the primary strategic engine for ABC (Thailand) Co., Ltd.'s competitive standing, collectively explaining a significant 70.9% of the variance in Competitive Advantage. These strong evidences were consistent with the research of Wujarso, Saprudin & Dameria (2021, p. 3053), who established HC as a unique, non-substitutable strategic resource essential for organizational success, and Mujtaba, Jamal, Qureshi & Shaikh (2018, p. 20), who found a high correlation between HC factors and competitive advantage, specifically citing the role of formal education and skills. In addition, these findings were consistent with the foundational HC concepts of Becker and Schultz and CA concept of Porter (1985, pp. 12-16).

Training and Skill Development and Education were confirmed as significant positive predictors, a necessity for navigating complex digital systems and regulations, which is supported by regional studies, including Shounchupon & Teerathanachaiyakun (2015, p. 25) and Thitratsamee, Saorom & Chaipanha (2019, p. 463), who confirmed HC's positive influence on operational agility and CA in Thai logistics. Crucially, Health and well-being emerged as the single strongest factor, reinforcing the argument that strategic investments in wellness yield superior returns by ensuring operational continuity, preventing burnout, and minimizing errors in the 24/7 high-stakes logistics environment this positive relationship is affirmed by Suwunniponth (2017, p. 12).

This study's most significant finding, however, is the paradoxical and statistically significant negative influence of Work Experience on CA, which suggesting a critical risk of skill obsolescence and organizational inertia in the high-velocity sector. This complex relationship is externally supported by Santa, Ferrer, Tegethoff & Scavarda (2022, p. 15), who reported a negative HC-performance link in some organizational contexts, and by Korry, Armanu, Sudjatno & Wijayanti (2024, p. 18), who found that experience alone did not directly translate to sustainable CA but required complementary, adaptive capabilities, emphasizing



that for ABC (Thailand) Co., Ltd., experience is only a strategic asset when dynamically revitalized to meet contemporary market needs.

The paradox of work experience

The most significant and counter-intuitive finding is the negative relationship between Work Experience and Competitive Advantage in this specific context. This finding challenges the traditional HR model that prizes long tenure above all else. This paradox can be attributed to several factors inherent in the modern logistics sector:

1. Technological Obsolescence: Experienced employees who fail to adapt to new technologies (e.g., automated warehousing, blockchain tracking, AI-driven optimization) may rely on manual or outdated methods, creating bottlenecks and reducing efficiency (undermining Cost leadership).

2. Organizational Inertia: Long-tenured employees can become resistant to process innovation, making the company slower to adopt necessary changes required for Differentiation and Market focus.

3. Mismatched Skills: The "experience" may be in traditional logistics (e.g., domestic road freight), while the firm's growth is in new areas (e.g., cross-border e-commerce or specialized cold chain logistics).

For ABC (Thailand) co., ltd., this result serves as a critical warning: work experience is only a strategic asset when it is constantly revitalized and coupled with mandatory up-skilling and a culture of adaptability.

RECOMMENDATIONS

Recommendations for applying research findings

Based on these findings, management at ABC (Thailand) Co., Ltd., and comparable logistics firms should implement the following strategic imperatives:

1. Prioritize Well-being Strategy: Allocate significant resources toward comprehensive Health and well-being programs (mental health support, fitness incentives, and work-life balance initiatives). This should be viewed not as a cost, but as the single most critical investment in operational resilience and service quality.

2. Mandate Continuous Reskilling: Shift the focus from simple training to mandatory, continuous reskilling programs, particularly for long-tenured employees. Experience must be



coupled with certified competency in new digital technologies and global standards to remain valuable.

3. Redefine 'Experience': Human Resource Metrics (HR metrics) should be revised to Measure "Relevant and Current Experience" rather than just "Tenure." Performance evaluations should weigh adaptability and adoption of new skills equally with length of service.

4. Strengthen Education-Skill Alignment: Ensure formal education pathways align directly with the firm's strategic needs (e.g., degrees in international logistics technology or supply chain analytics) to maintain a strong foundational knowledge base ($\beta=0.197$).

Recommendations for future research

This study was limited by its cross-sectional design and reliance on self-reported perception data from a single organization (ABC (Thailand) Co., Ltd.). Future research should employ a longitudinal design to track the evolution of these relationships over time, incorporate objective performance data (e.g., profitability, turnover rates) to validate the Competitive Advantage measures, and expand the study to include multiple firms across various logistics sub-sectors for enhanced generalizability.

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