

## Agility Strategies in Educational Management, Human Capital, and Supply Chain Resilience amid Crisis: A Resilience-Based Approach to PT Waskita Karya's Restructuring

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**Abstract:** The construction industry, particularly State-Owned Enterprises (SOEs) such as PT Waskita Karya, is currently navigating severe liquidity and operational distress within a highly volatile (VUCA) environment. Traditional economic equilibrium approaches, which center on cost-efficiency and market equilibrium, have proven inadequate for entities undergoing massive Master Restructuring Agreements (MRA). This article applies a Resilience and Agility Approach to analyze the integrated recovery strategies of Human Capital (HC) Management and Supply Chain (SC) Resilience. The study asserts that HC strategies must pivot from basic technical competency enhancements toward workforce agility focusing on crisis management, conflict resolution, and cross-divisional financial literacy. Concurrently, SC strategies must transition from lowest-cost procurement schemes to relational contracting and localized vendor redundancy to mitigate sudden project halts. The synthesis of this analysis concludes that an agile workforce is an absolute prerequisite for establishing a resilient supply chain. The integration of both elements serves as the fundamental engine not only for sustaining daily operational survival but also for ensuring the successful execution of Waskita Karya's overarching corporate restructuring agenda.

**Keywords:** *Human Capital Agility, Supply Chain Resilience, SOE Restructuring, PT Waskita Karya, Crisis Management.*

### A. Introduction

The national construction sector, particularly the State-Owned Enterprises (SOE) cluster, is currently navigating an unprecedented phase of liquidity and operational disruption. As a primary agent of infrastructure development, PT Waskita Karya (Persero) Tbk faces a dual mandate: executing National Strategic Projects (PSN), including infrastructure for the new capital city (IKN), while simultaneously battling massive financial distress. Leading up to the completion of its Master Restructuring Agreement (MRA), the company has had to restructure liabilities exceeding Rp80 trillion, involving dozens of banking creditors and bondholders. This high-volatility environment has directly paralyzed the company's daily supply chain. Restricted credit facilities have led to a loss of trust among sub-contractors and material suppliers, resulting in the imminent threat of strategic projects grinding to a halt.

In such a crisis state characterized by VUCA (Volatility, Uncertainty, Complexity, and Ambiguity), operational paradigms based on Economic Equilibrium have proven to lose their relevance. Classical economic theory assumes that firms will constantly find an optimal efficiency point between cost (supply) and productivity (demand). In practice, however, supply chain models reliant on lean management (minimal inventory) and lowest-cost procurement actually accelerate systemic collapse during a cash crisis. When a company cannot meet its payment terms, even the cheapest vendors will immediately halt supplies. Therefore, a theoretical paradigm shift is required—moving away from merely pursuing "market efficiency" toward ensuring "operational survival." This transition is best analyzed through the lenses of Resilience Theory and Dynamic Capabilities.

According to the Dynamic Capabilities framework (Teece, Pisano, & Shuen, 1997), an organization's competitive advantage and endurance do not rely on the optimization of static assets, but rather on its capacity to integrate, build, and reconfigure internal and external competencies rapidly in a drastically changing environment. In the context of Waskita Karya's Human Capital (HC), this theory dictates that technical competencies (civil and construction engineering) are no longer sufficient on their own. The organization demands Human Capital Agility, where project managers and field engineers are required to master cross-divisional financial literacy, conflict resolution, and crisis management. The workforce must possess the agility to execute real-time value engineering and modify engineering designs when specific materials are unavailable due to supplier embargoes.

Simultaneously, these enhanced HC capabilities must be deployed to build Supply Chain Resilience. This concept, as articulated by Ponomarov and Holcomb (2009), defines resilience as a supply chain's ability to prepare for unexpected events, respond to disruptions, and recover to a stronger operational state. For Waskita Karya, this means abandoning purely transactional approaches in favor of Relational Contracting. Resilience is no longer measured by how cheaply materials can be procured, but by how agilely the company can create redundancy (backup vendors) and foster empathetic partnerships with local sub-contractors to prevent project stagnation.

Addressing the gap between classical equilibrium theories and the reality of ground-level crises, this article aims to analyze how the integration of Human Capital agility and Supply Chain resilience strategies functions as the primary engine for operational recovery. This study will demonstrate that workforce and operational resilience are the absolute foundations determining the holistic success of PT Waskita Karya's financial restructuring agenda.

## **B. Methods**

This study employs a qualitative, exploratory case study design. According to Yin (2018), a case study is highly appropriate when examining complex, contemporary organizational phenomena within their real-life context, especially when the boundaries between the phenomenon (crisis management and restructuring) and the context (the Indonesian construction industry) are not clearly evident. By focusing on a single, in-depth case—PT

Waskita Karya (Persero) Tbk—this research can capture the nuanced dynamics of how human capital agility and supply chain resilience are operationalized during a massive financial distress period.

### **1. Data Collection**

Data for this research is collected through a combination of primary and secondary sources to ensure a comprehensive understanding of the restructuring process:

- **Primary Data (Semi-Structured Interviews):** Purposive sampling is utilized to select key informants directly involved in the company's operational recovery. Participants include senior project managers, supply chain/procurement directors, and human capital business partners (HCBP). The interview protocols focus on their real-time experiences in managing vendor relations, executing value engineering, and handling project disruptions during the Master Restructuring Agreement (MRA) phase.
- **Secondary Data (Document Review):** To corroborate the interview findings, the study analyzes Waskita Karya's official documents, including Annual Reports (2023–2025), MRA disclosure statements to the Indonesia Stock Exchange (IDX), internal standard operating procedures (SOPs) regarding crisis procurement, and relevant press releases.

### **2. Data Analysis**

The collected data is evaluated using thematic analysis, following the framework developed by Braun and Clarke (2006). The analysis involves transcribing interviews, generating initial codes regarding crisis response behaviors, and categorizing them into two main overarching themes: *Human Capital Agility* (e.g., cross-functional collaboration, conflict resolution, financial literacy) and *Supply Chain Resilience* (e.g., relational contracting, vendor redundancy, rapid reconfiguration).

### **3. Trustworthiness and Validity**

To ensure the rigorousness and validity of the findings, methodological triangulation is applied (Creswell & Poth, 2018). This involves cross-verifying the subjective accounts obtained from the interviews with the objective financial and operational data found in the company's restructuring documents. This triangulation minimizes researcher bias and provides a robust foundation for evaluating the true impact of the resilience strategies.

### **4. Mathematical Formulation of Resilience and Agility**

To complement the qualitative case study, this research incorporates a mathematical formulation to quantify the impact of Human Capital (HC) Agility on Supply Chain (SC) Resilience. Rather than using standard equilibrium equations, this study adopts the Resilience Triangle Model (adapted from Sheffi & Rice, 2005), which measures the loss of operational performance during a crisis and the trajectory of recovery.

Let  $V(t)$  represent the project's operational value or supply chain performance at time  $t$ . Under normal conditions (pre-crisis), the performance is at a steady state, denoted as  $V_0$ .

When a disruption occurs (e.g., a vendor halts material supply due to Waskita's liquidity constraint) at time  $t_d$ , the performance drops to a minimum level  $V_{\min}$ . The organization begins its recovery, reaching full operational capacity back to  $V_0$  at time  $t_f$ .

The total operational loss  $L$  during the disruption period is represented by the integral of the performance deficit:

$$L = \int_{t_d}^{t_f} [V_0 - V(t)] dt$$

The Role of Human Capital Agility ( $A_{hc}$ ): In a traditional model, the recovery time ( $\Delta t = t_f - t_d$ ) is prolonged due to rigid bureaucratic processes. However, under the Dynamic Capabilities framework, Human Capital Agility ( $A_{hc}$ ) directly accelerates the recovery rate, denoted as  $\alpha$ .

Assuming a linear recovery trajectory for simplicity, the recovery slope  $\alpha$  is a function of Human Capital Agility ( $A_{hc}$ ) and Supply Chain Redundancy ( $R_{sc}$ ):

$$\alpha = \frac{V_0 - V_{\min}}{t_f - t_d} = f(A_{hc}, R_{sc})$$

Therefore, the recovery duration  $\Delta t$  is inversely proportional to agility:

$$\Delta t \propto \frac{1}{A_{hc} \times R_{sc}}$$

By substituting the recovery parameters, the new resilience objective for Waskita Karya is not to minimize procurement costs, but to minimize the performance loss area ( $L$ ) by maximizing  $A_{hc}$  (e.g., rapid value engineering, agile conflict resolution) and  $R_{sc}$  (e.g., relational contracting and vendor backups). The resilient optimization constraint can be formulated as:

$$\min L \quad \text{subject to} \quad A_{hc} \geq A_{\text{target}}, \quad R_{sc} \geq 1$$

This formulation mathematically proves that without sufficient HC Agility ( $A_{hc} \rightarrow 0$ ), the recovery time approaches infinity, which accurately reflects the reality of stalled construction projects when field engineers and managers fail to adapt to supply chain shocks.

## C. Results and Discussion

The empirical findings from PT Waskita Karya's restructuring phase validate that classical economic efficiency models are insufficient during systemic liquidity crises. Instead, the integration of Human Capital (HC) Agility and Supply Chain (SC) Resilience successfully mitigated total operational collapse. The discussion is structured by analyzing the theoretical performance curve, practical HC interventions, and SC relational strategies.

### 1. Shifting the Resilience Curve: Mathematical and Theoretical Analysis

Based on the Resilience Triangle model introduced in the methodology, Waskita Karya's operational recovery can be visualized through a modified performance curve. In a

traditional rigid bureaucracy, a supply chain shock (e.g., vendor embargo due to unpaid invoices) causes operational value  $V(t)$  to plummet steeply to a critical low  $V_{min}$ , creating a massive area of operational loss  $L$ .

However, observational data indicates that Waskita Karya managed to alter this trajectory. By maximizing HC Agility ( $A_{hc}$ ) and SC Redundancy ( $R_{sc}$ ), the company shifted the curve in two specific ways:

1. Arresting the Decline: Agile project managers quickly negotiated standstill agreements with key vendors, preventing  $V(t)$  from dropping to zero. The new minimum performance state,  $V'_{min}$ , was kept significantly higher than the projected total shutdown scenario.
2. Accelerating the Recovery Slope ( $\alpha$ ): The rate of recovery ( $\alpha$ ) increased exponentially.

Mathematically, the integration of agility into the supply chain modified the recovery equation to:

$$\alpha_{agile} = \frac{V_0 - V'_{min}}{\Delta t} > \alpha_{traditional}$$

Because  $\alpha_{agile}$  is steeper, the recovery duration  $\Delta t$  was drastically shortened. The total performance loss, recalculated as:

$$L_{agile} = \int_{t_d}^{t_f} [V_0 - V'(t)] dt$$

proved to be substantially smaller than  $L_{traditional}$ . This conforms to the theoretical assertions by Ambulkar et al. (2015), who found that a firm's resource reconfiguration capability directly minimizes the disruption impact curve in volatile environments.

## 2. Human Capital Agility ( $A_{hc}$ ): Value Engineering and Crisis Negotiation

The data reveals that Waskita Karya did not achieve  $A_{hc}$  through traditional technical training, but by rapid upskilling in crisis management and financial literacy. During the Master Restructuring Agreement (MRA) phase, project cash flows were tightly restricted. This led to a "cash-and-carry" demand from material suppliers.

To counter this, Waskita's field engineers and project managers exercised **Dynamic Capabilities** (Teece et al., 1997) through rapid *Value Engineering*. When premium imported steel or specific cement brands were embargoed, agile engineering teams instantly modified structural designs to utilize available local materials without violating the National Indonesian Standards (SNI) for safety.

Furthermore, engineers were transformed into crisis negotiators. By transparently explaining the MRA cash-flow waterfall mechanisms to local vendors, HC agility prevented panic. This reflects the findings of Christopher and Peck (2004), who argue that a resilient supply chain requires a workforce capable of cross-functional decision-making rather than operating in siloed technical divisions.

### 3. Relational Contracting as Supply Chain Redundancy ( $R_{sc}$ )

Under classical equilibrium, procurement relies on competitive bidding to find the lowest price. However, during Waskita's liquidity crisis, this approach failed because vendors factored the high risk of default into their pricing. The study found that Waskita survived by pivoting to **Relational Contracting**, a core concept of the *Relational View* of competitive advantage (Dyer & Singh, 1998). Supply Chain Redundancy ( $R_{sc}$ ) was not achieved by holding expensive inventory (which was impossible due to zero cash reserves), but by leveraging relational capital.

- **Data Insight:** Waskita prioritized payments to micro, small, and medium enterprise (MSME) sub-contractors to maintain social capital and regional economic stability, while negotiating long-term debt-to-equity swaps or extended terms with tier-1 corporate suppliers.
- **Theoretical Implication:** By embedding trust and shared survival goals into vendor relations, Waskita created a "virtual redundancy." Vendors continued to supply materials based on relational trust rather than immediate financial equilibrium, effectively acting as the  $R_{sc}$  variable that kept the  $\Delta t$  (recovery time) from stretching indefinitely.

### 4. Synthesis with International Literature

The Waskita Karya case extends the current literature on supply chain resilience in emerging markets. While previous studies, such as Brandon-Jones et al. (2014), emphasize supply chain visibility as the main driver of resilience, this case study proves that in the context of state-owned enterprise (SOE) restructuring, **visibility is futile without human capital agility**.

Knowing that a supply chain is broken (visibility) does not solve the problem if the workforce lacks the authority, negotiation skills, or engineering agility to pivot instantly. Therefore, this article proposes an updated paradigm for SOE turnarounds: resilience is not merely a supply chain characteristic; it is an organizational capability deeply rooted in the cognitive and behavioral agility of its human capital.

### 5. Comparative Case Study Waskita Karya vs. Carillion plc

To further validate the efficacy of Human Capital Agility and Relational Contracting, it is imperative to conduct a comparative analysis with a failed restructuring attempt of a similar magnitude. The collapse of **Carillion plc** in 2018 formerly the UK's second-largest construction and facility management company serves as a quintessential counterfactual case study. Both Waskita Karya and Carillion faced highly leveraged balance sheets, razor-thin project margins, and severe liquidity crises stemming from aggressive expansion (House of Commons, 2018). However, their divergent approaches to human capital and supply chain management dictated entirely different outcomes.

#### a. The Failure of Coercive Procurement vs. The Success of Relational Contracting

When faced with a cash flow shortage, Carillion's leadership adhered to a transactional, equilibrium-based financial strategy. They unilaterally extended payment terms to their sub-contractors up to 120 days and implemented coercive supply chain finance schemes

(Morrell & Clark, 2018). This destroyed relational capital. When the liquidity crisis became public, vendors immediately abandoned Carillion's projects, triggering a total supply chain collapse and forcing the company into compulsory liquidation.

In stark contrast, Waskita Karya actively avoided transferring the financial distress entirely to its lower-tier supply chain. By employing **Relational Contracting** (Dyer & Singh, 1998) during the MRA negotiations, Waskita prioritized the survival of its Micro, Small, and Medium Enterprise (MSME) sub-contractors. Transparent communication regarding the restructuring waterfall mechanism built trust, ensuring that vendors did not prematurely pull out of ongoing strategic projects.

#### a. Rigid Financial Engineering vs. Operational HC Agility

Carillion attempted to solve its crisis predominantly from the boardroom through complex financial engineering, neglecting operational agility at the project level. Field managers lacked the autonomy to rapidly reconfigure project designs or negotiate directly with local suppliers (Loosemore & Lim, 2018).

Conversely, Waskita Karya exhibited strong **Human Capital Agility** ( $A_{hc}$ ). The company empowered its site managers and engineers to execute rapid *Value Engineering*—substituting embargoed premium materials with locally available, SNI-compliant alternatives without waiting for protracted centralized approvals. Waskita's field personnel were not just technical engineers; they acted as agile crisis managers and frontline negotiators.

The comparative analysis explicitly demonstrates that in the construction industry, attempting to survive a massive liquidity crisis through purely financial manipulation and coercive procurement (the Carillion approach) accelerates systemic failure. Meanwhile, the Waskita Karya case proves that operational survival can be secured by shifting the focus to workforce agility and empathetic supply chain resilience.

#### D. Conclusions

This study demonstrates that navigating a massive financial restructuring, such as the Master Restructuring Agreement (MRA) phase of PT Waskita Karya, requires a fundamental departure from classical economic equilibrium models. In a severe liquidity crisis characterized by high volatility (VUCA), prioritizing lowest-cost procurement and lean inventory actually accelerates systemic supply chain collapse. Instead, operational survival dictates a paradigm shift toward **Dynamic Capabilities** and **Resilience Theory**.

The empirical and mathematical analyses, utilizing the modified Resilience Triangle model, confirm that minimizing total operational loss ( $L$ ) is strictly dependent on two integrated variables: **Human Capital Agility** ( $A_{hc}$ ) and **Supply Chain Redundancy** ( $R_{sc}$ ).

Waskita Karya successfully shortened its recovery duration ( $\Delta t$ ) not through rigid, top-

down financial engineering, but by empowering field managers to execute rapid value engineering and crisis negotiation. Furthermore, the comparative analysis with the catastrophic collapse of Carillion plc highlights a vital lesson: coercive procurement and unilateral payment delays destroy trust and lead to liquidation. Conversely, Waskita's pivot to Relational Contracting—prioritizing transparency and the survival of MSME sub-contractors—created the virtual redundancy necessary to keep strategic projects running despite severe cash constraints.

Ultimately, this study concludes that in the context of State-Owned Enterprise (SOE) turnarounds, supply chain visibility and financial restructuring are futile without an agile workforce capable of rapid, decentralized decision-making. Human capital agility is the absolute prerequisite for building a resilient supply chain.

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