



# “A work-applied framework of dynamic resource management in the industrial value chain: Evidence from Thailand”

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# A WORK-APPLIED FRAMEWORK OF DYNAMIC RESOURCE MANAGEMENT IN THE INDUSTRIAL VALUE CHAIN: EVIDENCE FROM THAILAND

**Abstract**

Industrial value chains in emerging economies require integrated organizational capabilities to sustain adaptability and applied knowledge under technological and structural change. This study examines the structural relationships among dynamic resources, employee centricity, integrated knowledge, and practical knowledge management and tests a work-applied dynamic resource management framework within Thailand's industrial value chain.

A quantitative research design employing structural equation modeling was used, based on data collected from 600 executives and business owners across industrial sectors in Thailand. The results showed that the final model fit the empirical data well, with  $CMIN-p = 0.089$ ,  $CMIN/DF = 1.118$ ,  $GFI = 0.962$ , and  $RMSEA = 0.014$ . All hypothesized relationships were statistically significant at  $p < 0.001$ . Dynamic resources significantly influenced employee centricity and practical knowledge management, while employee centricity strongly reinforced integrated knowledge, representing the strongest structural path in the model ( $\beta = 0.93$ ). The model explained substantial variance in employee centricity, integrated knowledge, and practical knowledge management ( $R^2 = 0.80, 0.86, \text{ and } 0.93$ , respectively). New S-Curve industries also exhibited the highest overall dynamic resource management construct levels, reflecting stronger adaptive and knowledge-integrative orientations.

The findings indicate that organizational adaptability in industrial value chains is strengthened when adaptive resources, employee-centered governance, and integrated knowledge processes are aligned within a coherent capability structure.

**Keywords**

dynamic resources, value chain, knowledge integration,  
employee engagement, resource management, structural  
equation modeling

**JEL Classification**

L21, M12, O15, L23

**INTRODUCTION**

Contemporary industrial value chains face increasing structural pressures arising from rapid technological advancement, post-pandemic economic disruption, demographic transition, and labor contraction. These interrelated forces have reshaped how organizations mobilize and sustain resources within complex industrial systems, rendering conventional management approaches centered on efficiency and static coordination increasingly insufficient (Gläser, 2023; Pongsuwan et al., 2024). In environments characterized by persistent uncertainty, firms must continuously reconfigure their resources to maintain adaptability and competitiveness. Despite substantial investments in digital transformation, many industrial organizations continue to experience stagnant performance and limited adaptive capacity. Traditional management practices frequently treat technological as-

sets, human capital, and knowledge processes as separable elements rather than as components of an integrated capability structure.

Thailand's industrial sector exemplifies these systemic tensions. Although national strategies have prioritized industrial upgrading and innovation-driven growth, productivity stagnation, skill mismatches, and declining labor-force participation continue to constrain structural transformation (Office of the National Economic and Social Development Board of Thailand, 2018). Thailand's labor productivity ranking and declining global competitiveness underscore deep institutional and workforce-related constraints (International Institute for Management Development, 2022). Declining labor-force participation and skill-standard pass rates reinforce concerns regarding the effective utilization of human and knowledge-based resources within industrial systems (Thailand Development Research Institute, 2016; National Statistical Office of Thailand, 2020; Ministry of Labour of Thailand, 2021).

While dynamic capabilities theory and the knowledge-based view provide conceptual foundations for understanding adaptability and knowledge utilization, empirical clarification of their integrated structural interdependencies within the industrial ecosystem remains underdeveloped. The absence of an empirically specified structural framework limits theoretical integration and weakens the translation of capability-based insights into systematic managerial application within emerging industrial environments.

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## 1. LITERATURE REVIEW AND HYPOTHESES

Research on organizational adaptability has consistently shown that firms sustain competitiveness not merely by possessing valuable resources, but by reconfiguring those resources in response to environmental change. This body of scholarship emphasizes the capacity to redeploy and coordinate human, financial, and technological assets under shifting competitive and operational conditions (Eisenhardt & Martin, 2000; Teece, 2009). From this perspective, resources function not as passive inputs, but as dynamic mechanisms through which firms renew capabilities, strengthen resilience, and support innovation in turbulent environments. Empirical evidence further indicates that adaptive resource deployment contributes to productivity improvement, strategic maneuverability, and organizational performance, particularly in structurally constrained settings where sustained effectiveness depends on continuous adjustment rather than static efficiency (Singh & Fida, 2015; Lombardi et al., 2021). More recent studies also indicate that dynamic capability is better understood as an organizational outcome embedded in routines, managerial coordination, and renewal processes than as a fixed resource condition (Lisdiono et al., 2022).

Although this line of research explains why adaptive resource reconfiguration matters, it provides less clarity regarding how strategic flexibility is translated into operational practice. A related stream of scholarship addresses this issue by focusing on the human conditions that enable employees to enact change. Studies on employee engagement and supportive work systems show that psychological safety, recognition, meaningful participation, and developmental support strengthen motivation, resilience, and discretionary effort (Kahn, 1990; Bakker & Demerouti, 2007). These conditions are especially significant in industrial settings, where operational adjustment requires employees to interpret change, share tacit expertise, and revise routines under pressure. Empirical findings further demonstrate that employee-centered governance strengthens innovation capability and organizational effectiveness by creating conditions in which individuals contribute beyond formal role requirements and participate in continuous improvement (Harter et al., 2002; Lappalainen et al., 2024). Employees therefore function not only as implementers of strategy, but also as agents who translate adaptive intent into coordinated organizational action.

A further stream of literature highlights the role of knowledge integration in converting distributed expertise into practical organizational capa-

bility. Research within the knowledge-based view and knowledge management traditions shows that knowledge creates value when it is shared, combined, and embedded in decision processes, routines, and cross-functional collaboration rather than remaining isolated within individuals or units (Grant, 1996; Alavi & Leidner, 2001). Firms enhance operational effectiveness by transforming tacit and explicit knowledge into actionable practices through structured processes of acquisition, sharing, and application (Davenport & Prusak, 1998; Nonaka & Konno, 1998). In industrial value chains, this issue is especially important because learning must occur across functional and organizational boundaries to generate applied value. Despite its recognized importance, empirical studies have frequently treated knowledge management as an independent system rather than examining its structural connection with adaptive resource reconfiguration and employee-centered conditions.

Taken together, these scientific contributions suggest that dynamic resources, employee-centered organizational conditions, and knowledge integration are interdependent mechanisms rather than separate explanatory domains. Adaptive resource deployment shapes managerial and organizational conditions that support employee empowerment and engagement (Salvato & Vassolo, 2018; Apascariței & Elvira, 2022; Zabel & O'Brien, 2024). Empowered employees, in turn, facilitate knowledge sharing and cross-functional integration across organizational boundaries (Wang et al., 2019; Ngo et al., 2020). Knowledge integration then strengthens the transformation of learning into applied operational practice, particularly in technology-intensive and regulated environments where coordination and implementation quality are critical (Alonso et al., 2024; Eger & Žižka, 2024). These relationships are also consistent with stakeholder and social exchange perspectives, which indicate that valuing employee interests and fostering reciprocal organizational relationships contribute to long-term capability development and sustainability (Freeman & McVea, 2001; Sitzmann et al., 2025).

However, the literature still provides limited clarification of how these mechanisms are structurally connected within industrial value chains.

Previous studies have more often examined dynamic capability, knowledge systems, or employee engagement in isolation than empirically assessed their sequential relationships within a unified framework. This gap is especially relevant in industrial contexts characterized by technological transformation, structural heterogeneity, and uneven organizational conditions, where the effectiveness of dynamic resources may vary across sectors depending on technological intensity, organizational characteristics, and environmental pressures (Azarmipour et al., 2018; Pervan et al., 2018; Sukhawattanakun & Supapon, 2024; Zabel & O'Brien, 2024; Yewei et al., 2025).

Overall, prior research indicates that organizational adaptability depends on the interaction among adaptive resources, employee-centered conditions, and knowledge integration. Nevertheless, the scientific landscape remains fragmented because these elements have frequently been examined separately rather than as sequentially connected components of a single explanatory framework. This limitation is especially relevant in industrial value chains, where adaptive performance depends on the alignment of resource flexibility, workforce participation, and the practical use of knowledge across organizational processes. Further empirical clarification is needed regarding how these mechanisms are structurally connected within a work-applied framework in the industrial context.

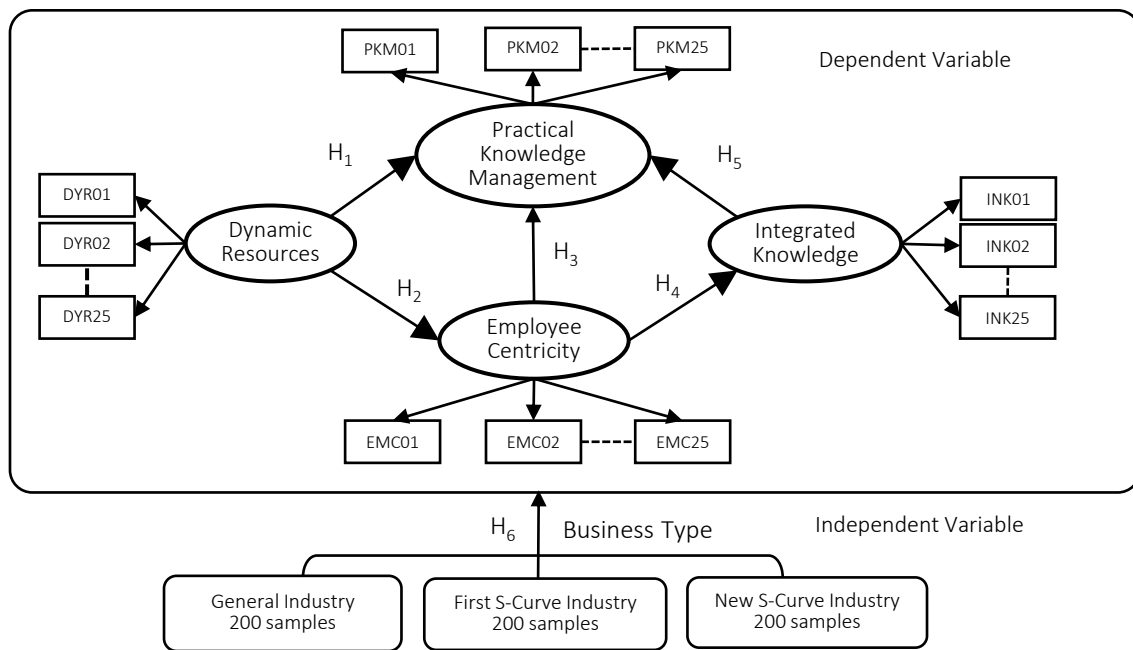
This study aims to examine the structural relationships among dynamic resources, employee centricity, integrated knowledge, and practical knowledge management and to test a work-applied dynamic resource management framework within Thailand's industrial value chain.

Based on the reviewed literature, six hypotheses are proposed as follows:

*H1: Dynamic resources positively influence practical knowledge management.*

*H2: Dynamic resources positively influence employee centricity.*

*H3: Employee centricity positively influences practical knowledge management.*



**Figure 1.** Conceptual framework

*H4: Employee centricity positively influences integrated knowledge.*

*H6: The structural relationships in the framework vary across industrial sectors.*

*H5: Integrated knowledge positively influences practical knowledge management.*

Figure 1 presents the conceptual model of the study and illustrates the hypothesized structural relationships among dynamic resources, employ-

**Table 1.** Theoretical and empirical foundations of the research hypotheses

Hypothesis	Structural Relationship	Theoretical Foundations	Key References
<i>H1: DYR → PKM</i>	Dynamic resource configuration strengthens the application of practical knowledge and operational effectiveness.	Dynamic Capabilities Theory; Knowledge-Based View	Grant (1996); Eisenhardt and Martin (2000); Alavi and Leidner (2001); Teece (2009); Allameh et al. (2020); Shehzad et al. (2024)
<i>H2: DYR → EMC</i>	Adaptive resource orchestration supports employee empowerment and engagement.	Resource-Based View; Human Capital Theory; Dynamic Capabilities Theory	Salvato and Vassolo (2018); Apascaritei and Elvira (2022); Zabel and O'Brien (2024)
<i>H3: EMC → PKM</i>	Employee centricity strengthens knowledge utilization in organizational practice.	Stakeholder Theory; JD-R Model	Kahn (1990); Bakker and Demerouti (2007); Iddris et al. (2023); Ștefan et al. (2024); Sitzmann et al. (2025)
<i>H4: EMC → INK</i>	Employee centricity governance promotes cross-functional knowledge integration.	Social Exchange Theory; Knowledge Integration Theory	Grant (1996); Freeman & McVea (2001); Wang et al. (2019); Ngo et al. (2020)
<i>H5: INK → PKM</i>	Integrated knowledge supports innovation and practical learning outcomes.	SECI Model; Organizational Learning Theory	Davenport and Prusak (1998); Nonaka and Konno (1998); Alonso et al. (2024); Eger and Žižka (2024)
<i>H6: Industry Variation</i>	The structural relationships in the framework vary across industrial sectors.	Contingency Theory; Industry-Based View	Azarmipour et al. (2018); Pervan et al. (2018); Sukhawatthanakun and Supapon (2024); Zabel and O'Brien (2024); Yewei et al. (2025)

Note: DYR is Dynamic Resources, PKM is Practical Knowledge Management, EMC is Employee Centricity, INK is Integrated Knowledge.

ee centricity, integrated knowledge, and practical knowledge management.

Table 1 provides a consolidated summary of the theoretical and empirical foundations underpinning the six research hypotheses.

Based on the theoretical and empirical foundations summarized in Table 1, the proposed work-applied framework was empirically examined using a quantitative research design.

## 2. METHODOLOGY

### 2.1. Research design and procedure

This study employed a quantitative research design to examine the structural relationships among dynamic resources, employee centricity, integrated knowledge, and practical knowledge management within Thailand's industrial value chain. Structural equation modeling was used as the main analytical approach because it enables the simultaneous estimation of multiple latent constructs and the testing of direct and indirect relationships within an integrated framework.

To reduce potential common method bias, several procedural remedies were implemented. Measurement items were clearly worded, anonymity was assured, and construct items were organized to minimize response consistency bias and evaluation apprehension.

A structured questionnaire was developed through a systematic literature review and expert validation (Appendix A). The instrument consisted of four sections. The first section captured organizational characteristics, including firm size, industrial cluster, and ownership structure, using five checklist items. The second section measured operational aspects of dynamic resource management through ten practice-oriented items. The third section assessed strategic dimensions across four latent constructs (DYR, EMC, INK, and PKM), each operationalized by 25 reflective indicators, yielding 100 measurement items. All items were rated on a five-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), consistent with established SEM mea-

surement practice (Hair et al., 2017). The relatively extensive item structure was designed to capture multidimensional aspects of strategic resource mobilization and knowledge governance within industrial contexts. The fourth section included three open-ended questions to obtain qualitative insights regarding implementation challenges and managerial recommendations.

Content validity was assessed using the Item Objective Congruence (IOC) technique. Five academic and industry experts evaluated item relevance, producing IOC values ranging from 0.60 to 1.00, exceeding the accepted 0.50 threshold (Koller et al., 2017). A pilot study involving 30 respondents yielded a Cronbach's alpha coefficient of 0.99, indicating high internal consistency. For the full sample, reliability coefficients remained strong, with Cronbach's alpha values of 0.97 (DYR), 0.96 (EMC), 0.95 (INK), and 0.98 (PKM). Corrected item-total correlations and standard deviation diagnostics confirmed satisfactory item discrimination (Hair et al., 2017).

### 2.2. Population and sampling

The target population comprised 92,422 manufacturing enterprises operating within Thailand's industrial value chain (Department of Industrial Works, Ministry of Industry of Thailand, 2022). A multi-stage cluster sampling approach combined with proportional stratified random sampling ensured representation across three industrial categories: General Industries, First S-Curve Industries, and New S-Curve Industries. A total of 1,000 questionnaires were distributed nationwide between August 2024 and January 2025 to executives and business owners who are directly responsible for strategic decision-making. The number of questionnaires distributed was determined based on feasibility within the defined sampling frame. At the same time, adequacy for structural equation modeling was ensured through the final usable sample size and the stratified design (Hair et al., 2017). Of these, 600 usable responses were returned, yielding a response rate of 60%. This level of participation is considered satisfactory for organizational survey research and supports the robustness of structural equation modeling procedures. The final sample size meets established requirements for SEM stability and statistical

power. A comparison between early and late respondents revealed no statistically significant differences across key constructs ( $p > 0.05$ ), indicating that non-response bias is unlikely to influence the results.

### 2.3. Ethical issues

Data were collected through a combination of online and on-site survey administration. Participation was voluntary, and confidentiality was ensured in accordance with the institution's ethical standards for research involving human participants. No personal identifiers were collected, and all responses were analyzed in aggregate form. The dataset was generated specifically for this study and has not been used in prior publications.

### 2.4. Data analysis method

Data analysis proceeded in four sequential stages. First, descriptive statistics were computed to summarize organizational and respondent characteristics. Qualitative responses to open-ended questions were analyzed using content analysis to identify recurring themes in dynamic resource management practices. Second, one-way ANOVA ( $F$ -test) was conducted to assess differences in dynamic resource management strategies across industrial clusters, with statistical significance established at  $p < 0.05$ . Third, Confirmatory Factor Analysis (CFA) was performed to evaluate the construct reliability and convergent and discriminant validity of the four latent variables. Finally, the structural model was estimated using AMOS Version 24 with maximum-likelihood estimation. Model fit was assessed using established goodness-of-fit criteria ( $\chi^2/df < 3.00$ ; GFI  $> 0.90$ ; CFI  $> 0.95$ ; RMSEA  $< 0.08$ ) (Henseler et al., 2016). Where theoretically supported, limited and controlled model refinement was applied to improve indicator loading consistency and overall model fit (Arbuckle, 2019).

## 3. RESULTS

The characteristics of industrial respondents were analyzed using complete data from 600 industrial enterprises across three clusters: General

Industries, First S-Curve Industries, and New S-Curve Industries, as presented in Table 2. Each cluster contributed 200 firms, representing 33.33% of the total sample, ensuring proportional representation across industrial categories.

Within First S-Curve Industries, the largest subgroup was Next-Generation Automotive (29.50%), followed by Food for the Future (28.00%), Agriculture and Biotechnology (25.00%), and Smart Electronics (17.50%). In the New S-Curve category, Digital industries accounted for the largest share (29.00%), followed by Biofuels and Biochemicals (22.00%), Aviation and Logistics (21.50%), Robotics (18.50%), and Medical Hub (9.00%).

Regarding firm size, large enterprises represented 40.33% of the sample, followed by medium-sized firms (35.17%) and small enterprises (24.50%). Investment sources were distributed across joint Thai-foreign investment (40.83%), Thai-only investment (40.50%), and foreign-only investment (18.67%). In terms of production methods, custom production accounted for 45.00%, proprietary-brand production for 31.83%, and in-house-designed production for 23.17%. Business operation years were relatively distributed across categories, with the largest proportion of firms operating for 5–10 years (28.33%), followed by 16–20 years (21.33%), 11–15 years (19.33%), more than 20 years (15.83%), and less than 5 years (15.18%).

Table 2 summarizes the distribution of organizational characteristics across the sampled industrial enterprises.

The levels of dynamic resource management (DRM) constructs differed significantly across the three industrial clusters (overall  $F = 6.00$ ,  $p = 0.003$ ). New S-Curve industries reported the highest overall mean score ( $\bar{X} = 4.43$ , S.D. = 0.45), followed by First S-Curve industries ( $\bar{X} = 4.29$ , S.D. = 0.47) and General industries ( $\bar{X} = 4.24$ , S.D. = 0.71). Significant differences were also observed for INK, DYR, EMC, and PKM, supporting H6 in relation to inter-industry differences in DRM construct levels.

Measurement adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) measure and

**Table 2.** Characteristics of the sampled industrial enterprises

Characteristics of the industrial business factors	Frequency	Percentage (%)
<b>Thai Industrial Business</b>		
Group 1: General Industries	200	33.33
Group 2: First S-Curve Industries in four subgroups	200	33.33
Next-Generation Automotive	59	29.50
Smart Electronics	35	17.50
Agriculture and Biotechnology	50	25.00
Food for the Future	56	28.00
Group 3: New S-Curve Industries, in five subgroups:	200	33.34
Robotics	37	18.50
Aviation and Logistics	43	21.50
Biofuels and Biochemicals	44	22.00
Digital	58	29.00
Medical Hub	18	9.00
<b>Business sizes</b>		
Small	147	24.50
Medium	211	35.17
Large	242	40.33
<b>Investment sources</b>		
Investment by Thai investors only	243	40.50
Investment by foreign investors only	112	18.67
Joint investment by both Thai and foreign investors	245	40.83
<b>Production methods</b>		
Custom production (client specifications)	270	45.00
In-house designed production	139	23.17
Proprietary brand production	191	31.83
<b>Business operation years</b>		
Less than 5 years	91	15.18
5–10 years	170	28.33
11–15 years	116	19.33
16–20 years	128	21.33
More than 20 years	95	15.83

**Table 3.** Comparison of DRM constructs across industry types

Strategies	General Industries		S-Curve Industries		New S-Curve Industries		F-Value	P-Value
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
INK	4.32	0.75	4.34	0.49	4.48	0.49	4.31	0.014
DYR	4.28	0.68	4.31	0.48	4.45	0.45	5.85	0.003
EMC	4.24	0.81	4.34	0.52	4.48	0.48	7.20	0.001
PKM	4.12	0.74	4.18	0.49	4.30	0.49	5.11	0.006
Overall	4.24	0.71	4.29	0.47	4.43	0.45	6.00	0.003

Note: Results are based on one-way ANOVA tests. Significance was assessed at  $p < 0.05$ . DYR is Dynamic Resources, PKM is Practical Knowledge Management, EMC is Employee Centricity, INK is Integrated Knowledge.

Bartlett's Test of Sphericity. The KMO value was 0.988, and Bartlett's test was significant ( $\chi^2 = 59,220.317$ ,  $df = 4,950$ ,  $p < 0.001$ ), confirming suitability for factor analysis. Construct reliability and validity were evaluated using CFA. All constructs met the recommended thresholds (C.R.  $\geq 0.70$ ; AVE  $\geq 0.50$ ), with C.R. ranging from 0.88 to 0.93 and AVE values ranging from 0.54 to

0.65. Discriminant validity was confirmed, as the square roots of the AVEs exceeded the inter-construct correlations.

Harman's single-factor test showed that the first factor explained 57.49% of the variance. A single-factor CFA demonstrated substantially poorer fit than the proposed multi-construct model, indi-

cating that a single latent source does not explain the covariance structure. Taken together, these results suggest that common method variance is unlikely to materially bias the findings.

Model evaluation confirmed an acceptable fit after refinement. The final SEM achieved CMIN- $p = 0.089 (> 0.05)$ , CMIN/DF = 1.118 ( $< 2.00$ ), GFI = 0.962 ( $> 0.90$ ), and RMSEA = 0.014 ( $< 0.08$ ), satisfying established model-fit criteria (Henseler et al., 2016; Arbuckle, 2019). Figure 2 presents the structural model with standardized path estimates. As shown in Table 4, all structural paths were statistically significant at  $p < 0.001$ . The standardized

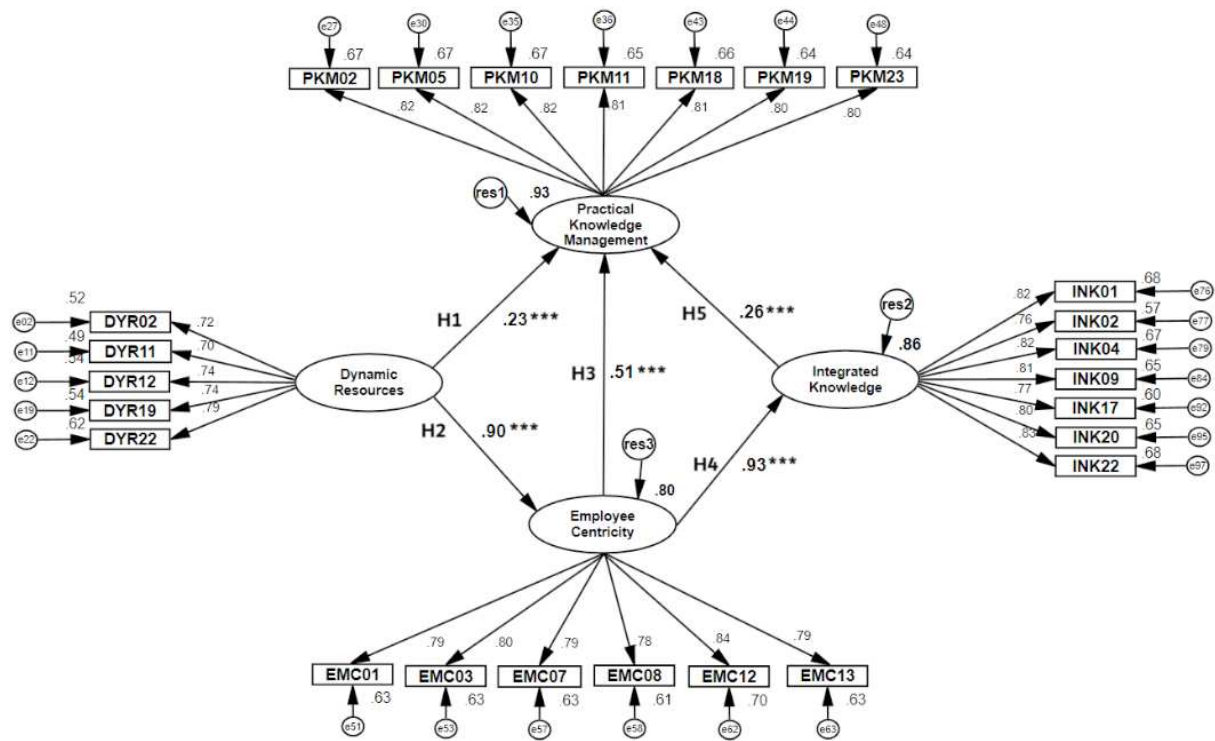
estimates were as follows: DYR  $\rightarrow$  PKM ( $\beta = 0.23$ ), DYR  $\rightarrow$  EMC ( $\beta = 0.90$ ), EMC  $\rightarrow$  PKM ( $\beta = 0.51$ ), EMC  $\rightarrow$  INK ( $\beta = 0.93$ ), and INK  $\rightarrow$  PKM ( $\beta = 0.26$ ). The structural model demonstrated strong explanatory capacity. The  $R^2$  values were 0.80, 0.86, and 0.93 for EMC, INK, and PKM, respectively.

Table 5 summarizes the three highest-scoring observed variables within each latent construct. All reported mean scores were above 4.30. Under dynamic resources, DYR02 ( $\bar{X} = 4.41$ , S.D. = 0.70), DYR12 ( $\bar{X} = 4.40$ , S.D. = 0.69), and DYR22 ( $\bar{X} = 4.36$ , S.D. = 0.74) recorded the highest values. Under Employee Centricity, EMC12 ( $\bar{X} = 4.38$ , S.D.

**Table 4.** Structural path estimates from SEM

Path	Standardized Estimate ( $\beta$ )	Unstandardized Estimate	C.R.	$p$ -value
DYR $\rightarrow$ PKM	0.23***	0.29	3.88	$< 0.001$
DYR $\rightarrow$ EMC	0.90***	1.10	17.24	$< 0.001$
EMC $\rightarrow$ PKM	0.51***	0.51	5.11	$< 0.001$
EMC $\rightarrow$ INK	0.93***	0.91	21.20	$< 0.001$
INK $\rightarrow$ PKM	0.26***	0.26	3.64	$< 0.001$

Note: \*\*\*  $p < 0.001$ . DYR is Dynamic Resources, PKM is Practical Knowledge Management, EMC is Employee Centricity, INK is Integrated Knowledge.



Chi-square = 301.794, df = 270,  $p = .089$   
 CMIN/DF = 1.118, GFI = .962, RMSEA = .014

**Figure 2.** Structural model

**Table 5.** Highest-scoring observed variables

Observed Indicator	$\bar{X}$	S.D.
<b>Dynamic Resources (DYR)</b>		
DYR02: Establishing formal committees to monitor labor productivity and address performance issues promptly.	4.41	0.70
DYR12: Implementing flexible budgetary policies that facilitate personnel development initiatives.	4.40	0.69
DYR22: Adopting strategic marketing policies to enhance employee productivity and organizational adaptability.	4.36	0.74
<b>Employee Centricity (EMC)</b>		
EMC12: Providing supervisory guidance that emphasizes encouragement over punitive control.	4.38	0.74
EMC01: Involving employees in organizational development initiatives.	4.36	0.78
EMC07: Allowing employees to propose and lead improvement initiatives.	4.35	0.76
<b>Integrated Knowledge (INK)</b>		
INK02: Embedding service quality knowledge that supports long-term customer value creation.	4.50	0.66
INK04: Establishing structured learning processes that stimulate innovation.	4.42	0.74
INK17: Integrating interdisciplinary knowledge to strengthen competitive positioning.	4.41	0.73
<b>Practical Knowledge Management (PKM)</b>		
PKM05: Facilitating stakeholder discussions to diagnose operational challenges.	4.43	0.73
PKM10: Supporting self-directed learning through digital platforms.	4.38	0.76
PKM18: Developing competencies through project-based assignments.	4.37	0.76

= 0.74), EMC01 ( $\bar{X}$  = 4.36, S.D. = 0.78), and EMC07 ( $\bar{X}$  = 4.35, S.D. = 0.76) were highest. For integrated knowledge, INK02 ( $\bar{X}$  = 4.50, S.D. = 0.66), INK04 ( $\bar{X}$  = 4.42, S.D. = 0.74), and INK17 ( $\bar{X}$  = 4.41, S.D. = 0.73) reported the highest means. Under practical knowledge management, PKM05 ( $\bar{X}$  = 4.43, S.D. = 0.73), PKM10 ( $\bar{X}$  = 4.38, S.D. = 0.76), and PKM18 ( $\bar{X}$  = 4.37, S.D. = 0.76) were the highest-rated indicators.

All hypothesized paths (H1–H5) were statistically significant ( $p < 0.001$ ), as summarized in Table 6. H1: DYR → PKM (Supported), H2: DYR → EMC (Supported), H3: EMC → PKM (Supported), H4: EMC → INK (Supported), and H5: INK → PKM (Supported).

Table 7 presents total, direct, and indirect effects among latent elements. DYR demonstrated both

**Table 6.** Results of hypotheses testing

Hypothesis	Path	Standardized Estimate ( $\beta$ )	p-Value	Result
H1	DYR → PKM	0.23***	< 0.001	Supported
H2	DYR → EMC	0.90***	< 0.001	Supported
H3	EMC → PKM	0.51***	< 0.001	Supported
H4	EMC → INK	0.93***	< 0.001	Supported
H5	INK → PKM	0.26***	< 0.001	Supported

Note: \*\*\*  $p < 0.001$ . DYR is Dynamic Resources, PKM is Practical Knowledge Management, EMC is Employee Centricity, INK is Integrated Knowledge.

**Table 7.** Direct, indirect, and total effects in the structural model

Endogenous Construct	Effect Type	DYR	EMC	INK	PKM
PKM	Direct	0.23***	0.51***	0.26***	–
	Indirect	0.68***	0.24***	–	–
	Total	0.91***	0.75***	0.26***	–
EMC	Direct	0.90***	–	–	–
	Indirect	–	–	–	–
	Total	0.90***	–	–	–
INK	Direct	–	0.93***	–	–
	Indirect	–	–	–	–
	Total	–	0.93***	–	–

Note: \*\*\*  $p < 0.001$ . DYR is Dynamic Resources, PKM is Practical Knowledge Management, EMC is Employee Centricity, INK is Integrated Knowledge.

direct and indirect effects on PKM. EMC and INK exhibited significant direct effects within the structural model.

## 4. DISCUSSION

The findings clarify how organizations in Thailand's industrial value chain transform adaptive resource configurations into operationalized knowledge capabilities within an increasingly digitalized and platform-mediated market environment. The tested structural relationships indicate that dynamic resources (DYR), employee centrality (EMC), integrated knowledge (INK), and practical knowledge management (PKM) operate as a coherent capability architecture rather than as independent managerial constructs. In contemporary industrial ecosystems characterized by digital supply chain integration, data-driven coordination, and technological convergence, such structural coherence is particularly important. This pattern extends dynamic capabilities theory by clarifying how adaptability becomes embedded in organizational routines rather than remaining at the level of strategic intent alone (Eisenhardt & Martin, 2000; Teece, 2009; Salvato & Vassolo, 2018). Adaptation is therefore enacted through structured engagement and systematic knowledge coordination within everyday practice, especially in digitally volatile environments where responsiveness depends on real-time alignment across people, processes, and information flows.

The strong structural influence of dynamic resources on employee centrality, together with its amplified total effect on practical knowledge management through indirect mechanisms, indicates that resource flexibility acquires operational value when supported by employee-centered governance. In digital market environments, investments in advanced technologies, automation, analytics, and process redesign are unlikely to yield sustained performance benefits unless workforce systems can interpret, integrate, and apply these inputs in practice. This interpretation is consistent with integrative perspectives on human resource dynamism, which emphasize the interaction between strategic resource configuration and developmental orga-

nizational systems (Apascaritei & Elvira, 2022). Evidence from Thai industrial sectors further suggests that structured management systems combined with participatory operational practices strengthen both efficiency and learning outcomes (Sukhawattanakun et al., 2023). Dynamic resources thus create the structural conditions for adaptability, while employee-centric systems translate those conditions into reflective practice, collaborative execution, and practical adjustment. This result also suggests that digital transformation should be understood not as a purely technological undertaking, but as an organizational process that depends on employees' readiness to absorb and enact change.

The pronounced linkage between employee centrality and integrated knowledge further reinforces the role of employees as central knowledge integrators in digitally connected value chains. As organizations increasingly operate within interconnected digital ecosystems, cross-functional knowledge coordination becomes more complex and more strategically consequential. Consistent with the knowledge-based view, organizational knowledge is most productive when coordinated through human interaction rather than stored in systems or distributed across units (Grant, 1996). Employee-centric practices that cultivate trust, inclusion, and empowerment appear to reduce barriers to knowledge sharing and strengthen integration processes across functional and organizational boundaries (Salehi & Alanbari, 2024; Shehzad et al., 2024). In digitally transforming industries, these relational governance mechanisms are particularly important because they mitigate fragmentation arising from technological specialization, functional separation, and rapid process change. The findings therefore indicate that employee-centricity does not merely enhance morale or organizational climate, but performs a structurally enabling role in the conversion of dispersed expertise into integrated organizational knowledge.

The positive association between integrated knowledge and practical knowledge management further confirms that knowledge contributes to organizational effectiveness only when embedded in operational routines and

repeatable work practices. This finding is consistent with foundational knowledge management theory, which emphasizes the movement from knowledge creation to knowledge utilization as a basis for performance improvement (Davenport & Prusak, 1998; Alavi & Leidner, 2001). It is also aligned with the SECI framework, which explains how tacit and explicit knowledge interact to generate organizational learning and innovation (Nonaka & Konno, 1998). More recent studies similarly indicate that structured knowledge enablers and digitally supported integration mechanisms strengthen innovation-oriented and coordination-dependent outcomes (Alonso et al., 2024; Ştefan et al., 2024). In industrial environments characterized by accelerated information flows, shorter innovation cycles, and greater operational interdependence, the ability to institutionalize integrated knowledge into daily practice becomes a defining source of competitive sustainability. The high explanatory capacity observed for practical knowledge management therefore suggests that practical capability does not emerge from knowledge availability alone, but from the alignment of adaptive resource governance, employee engagement, and institutionalized knowledge processes within digitally evolving industrial infrastructures.

Comparative evidence across industrial clusters reveals that New S-Curve industries exhibit stronger adaptive orientation and higher knowledge-integration intensity than other industrial groups. This pattern likely reflects their greater exposure to technological disruption, platform-based competition, and global digital integration. The result is consistent with prior research linking industry dynamism and the deployment of dynamic capabilities to performance differentials across sectors (Pervan et al., 2018; Zabel & O'Brien, 2024). Within emerging economies, competitiveness appears to strengthen when digital transformation initiatives are synchronized with human capability development and coordinated knowledge processes rather than pursued as isolated technical reforms (Eger & Žižka, 2024). These findings suggest that digital market turbulence does not reduce the importance of managerial coherence. On the contrary, it underscores the need for an integrated resource

management structure that aligns technological adaptation, workforce participation, and knowledge application across the value chain.

Overall, the findings empirically specify a layered capability architecture in which resource adaptability is activated through employee-centric governance and subsequently institutionalized through knowledge integration mechanisms that sustain operational performance in digitally transforming industrial ecosystems. The study extends understanding of how dynamic capabilities are enacted at the organizational level within emerging industrial contexts and demonstrates that resilience and competitiveness depend on the structural alignment of flexibility, engagement, embedded knowledge practice, and digital coordination capacity.

#### 4.1. Implications

From a theoretical standpoint, these findings refine the explanation of organizational adaptability by showing that dynamic resources, employee centrality, integrated knowledge, and practical knowledge management are not separate organizational attributes, but sequentially connected components of a unified capability structure. This interpretation adds greater precision to dynamic capabilities and knowledge-based perspectives by clarifying the internal pathway through which adaptive resource reconfiguration is translated into applied organizational knowledge within industrial value chains. The study therefore contributes by moving the discussion beyond broad claims about adaptability and toward a more explicit account of the organizational mechanisms through which adaptability becomes operationally effective.

From a practical standpoint, the results indicate that industrial firms are more likely to achieve stronger applied knowledge outcomes when adaptive resources, employee-centered systems, and knowledge integration processes are managed in a coordinated manner rather than through isolated managerial interventions. In digitally evolving industrial environments, investments in technology and structural flexibility yield greater value when supported by participatory workforce systems, cross-functional knowledge mechanisms, and organizational routines that embed learning into routine operations. For managers in Thailand's in-

dustrial value chain, this implies that sustainable competitiveness depends not only on acquiring advanced resources but also on creating the organizational conditions through which those resources can be interpreted, shared, and translated into practical performance.

Future research may build on the present findings by employing longitudinal and comparative research designs to examine whether the observed structural relationships remain stable

across different levels of digital intensity, technological maturity, and regulatory variation. Further studies may also investigate the roles of artificial intelligence, platform governance, and sustainability-oriented coordination as additional factors shaping the effectiveness of dynamic resource management in industrial value chains. Such extensions would help clarify the boundary conditions and developmental trajectories of capability integration in digitally evolving industrial ecosystems.

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## CONCLUSION

This study examined the structural relationships within a work-applied dynamic resource management framework in Thailand's industrial value chain. The findings indicate that dynamic resources significantly strengthened employee centricity and contributed to practical knowledge management both directly and indirectly through integrated knowledge. Employee centricity also significantly reinforced integrated knowledge, which in turn further supported practical knowledge management. Among the tested relationships, the strongest path was from employee centricity to integrated knowledge ( $\beta = 0.93$ ), indicating the central role of employee-centered conditions in converting adaptive capacity into integrated organizational knowledge. These results support the conclusion that organizational adaptability in industrial value chains depends on the structural alignment of adaptive resources, employee-centered governance, and institutionalized knowledge processes that translate learning into practical performance. In addition, the comparison across industrial clusters indicated significant differences in dynamic resource management construct levels, with New S-Curve industries reporting the highest overall scores.

## AUTHOR CONTRIBUTIONS

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## COMPLIANCE WITH ETHICAL STANDARDS

This study was reviewed and approved by the Kasetsart University Research Ethics Committee under Study Code No. KUREC-CSC66/005, Certificate of Approval No. COE66/002. All research procedures were conducted in accordance with established ethical standards. Informed consent was obtained from all participants prior to data collection, and confidentiality and anonymity were strictly maintained throughout the research process.

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## APPENDIX A

### Questionnaire: Dynamic resource management in the industrial value chain in Thailand

#### Part 1: Organizational characteristics

Instructions: Please tick  the option that best reflects your organization's characteristics or provide additional details in the space provided where applicable.

##### 1. What is the primary industry of your organization?

- General Industries: (please specify): .....
- First S-Curve Industries:
  - Next-Generation Automotive
  - Smart Electronics
  - Agriculture and Biotechnology
  - Food for the Future
- New S-Curve Industries:
  - Robotics
  - Aviation and Logistics
  - Biofuels and Biochemicals
  - Digital
  - Medical Hub

##### 2. What is the size of your organization?

- Small (fewer than 50 employees, revenue less than THB 100 million)
- Medium (fewer than 200 employees, revenue less than THB 500 million)
- Large (more than 200 employees, revenue of more than THB 500 million)

##### 3. What is the nature of your organization's investment sources?

- Investments by Thai investors only
- Investments by foreign investors only
- Joint investment by both Thai and foreign investors

##### 4. What is the predominant nature of your production?

- Custom production based on client specifications
- In-house designed production.
- Production under a proprietary brand name

##### 5. How long has your organization been in operation?

- Less than 5 years
- 5–10 years
- 11–15 years
- 16–20 years
- More than 20 years

## Part 2. Organizational practices

Instructions: Please tick  the option that most accurately reflects your organization's practices or provide additional details in the space provided where applicable.

### 1. What is the organizational structure that your workplace emphasizes the most?

- Centralized (Centralization)
- Decentralized (Decentralization)
- Hybrid
- Others (please specify): .....

### 2. What are the core competencies of your personnel's skills?

- Analytical thinking and innovation
- Participative learning and strategic learning methods
- Ability to solve complex problems
- Critical thinking and judgment
- Originality and creativity
- Leadership and social influence
- Others (please specify): .....

### 3. Which factor does your organization prioritize the most regarding production inputs?

- Financial resources
- Human resources
- Raw materials, machinery, and technology
- Management systems
- Others (please specify): .....

### 4. On average, how often do employees in your organization undergo training sessions annually?

- One to two times per person per year
- Three to five times per person per year
- More than five times per person per year
- Others (please specify): .....

### 5. At what level does your organization primarily focus on employee training to enhance skills and knowledge?

- Operational personnel
- Supervisors
- Managers
- Senior executives
- Others (please specify): .....

### 6. What has caused your organization's most significant waste (losses) over the past year?

- Overproduction
- Excess inventory
- Transportation

- Production processes
- Defective products
- Delays due to waiting times
- Others (please specify): .....

**7. Which characteristics of product quality does your organization prioritize the most?**

- Aesthetic appeal
- Special Features
- Safety
- Reliability
- Durability
- After-sales service
- Others (please specify): .....

**8. Which key elements of quality management does your organization focus on the most?**

- Clarity of objectives and long-term commitment
- Process-oriented approaches
- Use of statistical methods
- Continuous process improvement
- Collaboration with suppliers and business partners
- Customer focus
- Leadership
- Others (please specify): .....

**9. What strategies does your organization use most to improve employee productivity?**

- Training to improve capabilities
- Gradual increases in performance targets
- Mutual supports
- Setting clear and reasonable deadlines
- Adjusting performance measurement factors
- Offering rewards
- Performance evaluations
- Selecting competent personnel
- Assigning tasks that match interests or expertise
- Continuously developing work methods
- Others (please specify): .....

**10. What is the organization's utilization gains from productivity improvement outcomes?**

- Establishing production or organizational standards
- Using it as a performance measurement criterion
- Setting it as a work goal
- Reducing production costs and increasing profits
- Enabling smoother operations and further progress within the organization
- Surpassing competitors with higher standards
- Attracting talented employees
- Others (please specify): .....

### Part 3. Measurement of dynamic resource management constructs

Instructions: Please indicate the extent to which each statement reflects your organization's actual practices in managing dynamic resources within the industrial value chain. Response Scale: 5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

Measurement of dynamic resource management strategies in the industrial value chain		Scale				
		5	4	3	2	1
<b>1. Dynamic Resources (DYN)</b>						
DYN 01	Assessing competency development needs in alignment with strategic objectives.					
DYN02	Establishing formal committees to monitor labor productivity and address performance issues promptly.					
DYN03	Integrating organizational IT systems with Big Data technologies to enhance talent acquisition and workforce placement.					
DYN04	Maintaining equitable salary structures with timely adjustments reflecting economic and social conditions.					
DYN05	Defining clear roles and responsibilities aligned with organizational goals.					
DYN06	Developing structured programs that enhance innovation capabilities among personnel.					
DYN07	Formulating short- and long-term competency development plans aligned with organizational strategy.					
DYN08	Maintaining structured digital repositories to facilitate access to technological knowledge.					
DYN09	Providing accessible online learning platforms that support continuous development.					
DYN10	Procuring advanced equipment and virtual training tools to strengthen skill development.					
DYN11	Engaging qualified expert trainers to support competency enhancement.					
DYN12	Implementing flexible budgetary policies that facilitate personnel development initiatives.					
DYN13	Allocating dedicated budgets for competency development within annual financial planning.					
DYN14	Allocating dedicated time for employees to develop innovative production solutions.					
DYN15	Establishing clear Key Performance Indicators (KPIs) to evaluate personnel development outcomes.					
DYN16	Formalizing collaborative agreements (MOUs) with external partners to enhance competency development.					
DYN17	Defining functional competencies for each position to support systematic development planning.					
DYN18	Operating structured monitoring systems that support continuous quality improvement.					
DYN19	Promoting communities of practice (CoP) that facilitate organizational knowledge exchange.					
DYN20	Developing operational manuals and structured work guides that support learning integration.					
DYN21	Implementing flexible personnel management policies that strengthen organizational adaptability.					
DYN22	Adopting strategic marketing policies to enhance employee productivity and organizational adaptability.					
DYN23	Coordinating cross-functional work processes to improve organizational efficiency and effectiveness.					
DYN24	Designing work environments that encourage learning and knowledge exchange.					
DYN25	Establishing internal research units that generate new knowledge and innovative production methods.					
<b>2. Integrated Knowledge (INK)</b>						
INK01	Developing employees' adaptive knowledge and skills to respond to organizational change.					
INK02	Embedding service quality knowledge that supports long-term customer value creation.					
INK03	Promoting growth-oriented learning practices that strengthen developmental mindsets.					
INK04	Establishing structured learning processes that stimulate innovation.					
INK05	Developing entrepreneurial competencies that enhance opportunity recognition.					
INK06	Codifying operational knowledge into formal procedures to ensure consistency.					
INK07	Integrating resource efficiency principles into organizational learning systems.					
INK08	Embedding change-oriented values that support awareness of organizational transformation.					
INK09	Implementing systems that facilitate formal and informal knowledge sharing.					
INK10	Integrating environmental knowledge into operational decision-making processes.					
INK11	Developing risk management knowledge to strengthen organizational resilience.					
INK12	Embedding workplace safety knowledge into operational training systems.					
INK13	Strengthening organizational commitment through shared knowledge and learning alignment.					
INK14	Enhancing analytical and prioritization skills for effective decision-making.					
INK15	Developing structured processes that support logical and evidence-based reasoning.					
INK16	Generating knowledge through collaborative exchanges with external partners (MOUs).					
INK17	Integrating interdisciplinary knowledge to strengthen competitive positioning.					
INK18	Designing targeted training programs based on competency gap assessments.					
INK19	Providing specialized training that enhances advanced technological knowledge.					
INK20	Integrating knowledge of business continuity planning (BCP) into organizational preparedness systems.					
INK21	Preparing employees with relevant knowledge prior to adopting new tools or technologies.					

Measurement of dynamic resource management strategies in the industrial value chain		Scale				
		5	4	3	2	1
INK22	Conducting systematic work analysis to identify inefficiencies and improvement opportunities.					
INK23	Applying engineering knowledge principles (e.g., ECRS) to reduce operational waste.					
INK24	Embedding entrepreneurial education that supports balanced risk evaluation.					
INK25	Integrating sustainability knowledge into operational resource management practices.					
<b>3. Practical Knowledge Management (PKM)</b>						
PKM01	Establishing shared operational goals that align with stakeholder understanding.					
PKM02	Utilizing agile cross-functional teams with delegated decision-making authority.					
PKM03	Organizing knowledge workshops on contemporary operational and strategic topics.					
PKM04	Selecting appropriate learning tools that enhance practical knowledge acquisition.					
PKM05	Facilitating stakeholder discussions to diagnose operational challenges.					
PKM06	Applying learning-by-doing approaches to improve work performance.					
PKM07	Sending employees to collaborative partner training programs for experiential knowledge exchange.					
PKM08	Conducting technology-enabled training using virtual simulation tools.					
PKM09	Implementing coaching systems that support experiential knowledge transfer.					
PKM10	Supporting self-directed learning through digital platforms.					
PKM11	Providing hands-on demonstrations to strengthen practical skill development.					
PKM12	Delivering structured in-house and external training programs.					
PKM13	Accessing specialized and up-to-date expert knowledge resources.					
PKM14	Assigning employees to accredited competency assessments.					
PKM15	Facilitating job shadowing to enable experiential learning.					
PKM16	Expanding job responsibilities to strengthen applied competencies.					
PKM17	Encouraging peer-to-peer learning through practice sharing.					
PKM18	Developing competencies through project-based assignments.					
PKM19	Implementing job rotation to broaden experiential knowledge.					
PKM20	Reviewing operational manuals to refine daily work practices.					
PKM21	Providing structured performance feedback that supports improvement.					
PKM22	Operating internal audit systems to monitor knowledge application outcomes.					
PKM23	Using evaluation results to refine operational processes.					
PKM24	Conducting operational risk assessments related to workforce activities.					
PKM25	Encouraging reflective learning from past errors to enhance efficiency.					
<b>4. Employee Centricity (EMC)</b>						
EMC01	Involving employees in organizational development initiatives.					
EMC02	Operating participatory governance systems that ensure mutual organizational benefits.					
EMC03	Encouraging team-building activities that strengthen internal collaboration.					
EMC04	Ensuring fair supervisory practices that promptly address employee concerns.					
EMC05	Promoting open communication between employees and supervisors.					
EMC06	Sharing internal information transparently to enhance organizational understanding.					
EMC07	Allowing employees to propose and lead improvement initiatives.					
EMC08	Recognizing contributions beyond formal responsibilities.					
EMC09	Supporting advanced education opportunities for high-potential employees.					
EMC10	Identifying leadership potential for succession planning.					
EMC11	Establishing fair performance evaluation systems that support career progression.					
EMC12	Providing supervisory guidance that emphasizes encouragement over punitive control.					
EMC13	Developing transparent promotion pathways for high-performing employees.					
EMC14	Recognizing exemplary work performance that reinforces organizational standards.					
EMC15	Supporting employee well-being as part of people-centered governance.					
EMC16	Acknowledging employee achievements through formal recognition mechanisms.					
EMC17	Recognizing contributions that create organizational or societal value.					
EMC18	Providing performance-linked incentives aligned with organizational outcomes.					
EMC19	Allowing motivated employees to select development programs with approval.					
EMC20	Supporting specialized training completion with appropriate incentives.					
EMC21	Empowering skilled employees to serve as internal trainers.					
EMC22	Providing structured career advancement opportunities to retain talent.					
EMC23	Encouraging employee participation in organizational problem-solving.					
EMC24	Assigning roles based on demonstrated competency to foster trust and pride.					
EMC25	Recognizing outstanding dedication and performance as organizational exemplars.					

## Part 4. Open-ended reflections

Instructions: Please provide your professional opinions and suggestions in the space provided below.

- 1. Beyond the strategies for dynamic resource management presented in Part 3, are there additional approaches that your organization considers important?**

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- 2. What are the most significant obstacles to advancing dynamic resource management within the industrial value chain?**

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- 3. What types of government policies or institutional support would most effectively strengthen dynamic resource management within the industrial value chain?**

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Thank you very much for your cooperation.