

## Talent Management Strategies in Responding to Industry 5.0 Disruption: A Competency- and Agility-Based Human Resource Development Model

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### ABSTRACT

*The transition to Industry 5.0 requires organizations to adopt human-centered and sustainable strategies in managing their workforce. Talent management is no longer an administrative function but a strategic mechanism for developing competencies and agility to sustain competitive advantage. This study aims to analyze how competency-based talent management integrated with agility as a dynamic capability forms an effective human resource development model in responding to Industry 5.0 disruption. This research employs a quantitative explanatory design using a cross-sectional survey of managers and HR professionals in digitally transforming organizations. Data were collected through structured questionnaires and analyzed using Structural Equation Modeling to test direct and mediating relationships among competency-based talent management, agility, and sustainable competitive advantage. The findings reveal that competency-based talent management significantly influences agility, and agility significantly enhances sustainable competitive advantage. Moreover, agility partially mediates the relationship between competency-based talent management and sustainable performance, indicating that competencies must be activated through adaptive capabilities to generate long-term value. The study concludes that integrating competency development with agility-building mechanisms is essential for achieving sustainable competitiveness in the Industry 5.0 era.*  
**Keywords:** Agility; Competency-based HRD; Industry 5.0; Sustainable competitive advantage; Talent management.

### INTRODUCTION

The transition toward Industry 5.0 marks a profound transformation in the global economic and industrial landscape. Unlike Industry 4.0, which primarily emphasized automation, efficiency, and technological integration, Industry 5.0 repositions human beings at the center of innovation, sustainability, and resilience. Advanced technologies such as artificial intelligence, big data analytics, cyber-physical systems, and intelligent automation are no longer viewed as ends in themselves, but as instruments that enhance human creativity, ethical intelligence, and collaborative capacity. Within this paradigm, human resource management cannot remain an administrative support function; instead, it must evolve into a strategic driver of organizational competitiveness. Contemporary literature highlights that talent management has become a strategic necessity rather than a complementary managerial practice in navigating the transition from Industry 4.0 to Industry 5.0 (Samuels & Pelsler, 2025; Hutasoit et al., 2025; Modgil et al., 2023; Masudi et al., 2025).

A critical phenomenon emerging in this era is the widening gap between existing workforce capabilities and the competencies required in Industry 5.0 ecosystems. Rapid



digitalization and technological convergence demand continuous reskilling and upskilling to ensure that employees can effectively collaborate with intelligent systems while maintaining uniquely human attributes such as creativity, empathy, and complex problem-solving. However, many organizations still rely on conventional talent management approaches that emphasize administrative processes rather than strategic capability development. Research indicates that Industry 5.0 requires the integration of digital literacy, data analytics, supply chain technologies, adaptive leadership, and advanced soft skills including communication, collaboration, and innovation (Hutasoit et al., 2025; Samuels & Pelser, 2025; Modgil et al., 2023; Poláková et al., 2023; Prieto & Talukder, 2023). The absence of systematic competency mapping and dynamic development mechanisms has created structural vulnerabilities that limit organizational responsiveness to technological disruption.

The challenges are further intensified by the emergence of VUCA 2.0 conditions characterized by heightened volatility, uncertainty, complexity, and ambiguity. Organizations must operate within interconnected global networks while simultaneously responding to crises such as pandemics, geopolitical instability, and climate-related disruptions. In this context, collaborative talent management models are increasingly necessary. These models emphasize cross-functional integration, inter-sectoral partnerships, and digital technology utilization to enhance responsiveness and strategic alignment. Empirical studies demonstrate that digital platforms and artificial intelligence can facilitate data-driven decision-making, predictive talent analytics, and integrated workforce planning (Chew & Zainal, 2024; Sudewo et al., 2025). Nevertheless, the implementation of such collaborative and technology-enabled approaches remains uneven, revealing a practical gap between theoretical advancements and organizational practice.

Competency-based human resource development emerges as a strategic foundation for addressing these challenges. Strategic HRD frameworks emphasize that competency development must be aligned with organizational vision and long-term strategy. Core competencies encompassing knowledge, skills, abilities, and other characteristics must be clearly identified, measured, and continuously enhanced (Saleh et al., 2023; Fomenko, 2025; Bahri & Salsiati, 2024). The process typically involves identifying key competencies, conducting gap analyses, designing targeted development programs, implementing structured training initiatives, evaluating performance based on competency indicators, and integrating talent and succession management systems. Such systematic approaches enable organizations to build sustainable internal capabilities that support innovation and adaptability (Bahri & Salsiati, 2024; Septiadi & Ramdani, 2024; Kyrianova et al., 2025).

The integration of digital technologies further strengthens competency-based HRD practices. The use of Learning Management Systems, e-learning platforms, HR analytics, and people analytics allows organizations to personalize learning pathways, monitor competency progress in real time, and connect development outcomes with strategic performance indicators (Fomenko, 2025; Septiadi & Ramdani, 2024). Despite these technological advancements, research indicates that digital transformation in HR often focuses predominantly on technological tools rather than on cultivating adaptive organizational cultures. Consequently, technical competency development alone may not guarantee sustainable performance unless it is complemented by dynamic capabilities that enable rapid adaptation.

In this regard, agility has emerged as a critical dynamic capability in Industry 5.0. Organizational agility reflects the ability to sense environmental changes, seize strategic opportunities, and transform internal processes in response to shifting conditions.

Recent studies position agility as a mediating mechanism that connects digital and green orientations with sustainable performance outcomes (Saiyed et al., 2025; Li & Zhang, 2025; Li et al., 2025). Organizational agility significantly influences the successful implementation of sustainability strategies and the achievement of long-term competitive advantage (Kwasek et al., 2025; Miceli et al., 2021; Saiyed et al., 2025; Li & Zhang, 2025). This perspective underscores that adaptability is not merely a reactive capacity but a strategic capability embedded within organizational systems and leadership practices.

Empirical evidence further suggests that agility, including resilient individual agility, serves as a necessary and sufficient condition for sustainable organizational performance. Agility mediates the relationship between knowledge sharing, sensing capability, and sustainable outcomes, indicating that learning processes must be integrated with adaptive execution mechanisms (Prieto & Talukder, 2023; Li et al., 2025; Li & Zhang, 2025). Key drivers of agility include rapid and accurate decision-making, strong identification with organizational goals, effective internal communication, a culture of continuous learning and innovation, and support for work–life balance (Kwasek et al., 2025; Miceli et al., 2021; Aponte-López & Torrealba, 2025). These findings demonstrate that agility is deeply intertwined with human capital development and organizational culture.

Despite the extensive literature on talent management, competency development, and agility, these constructs are often examined independently. Studies on digital transformation in HR primarily focus on technological adoption, while competency-based HRD research emphasizes structured development frameworks without explicitly incorporating agility as a mediating dynamic capability. Conversely, agility research is frequently situated within strategic management or innovation studies without direct linkage to structured talent management systems (Modgil et al., 2023; Saiyed et al., 2025). This fragmentation reveals a significant research gap in the development of an integrative model that simultaneously connects strategic talent management, competency-based HRD, and agility within the Industry 5.0 context.

Moreover, existing empirical evidence is largely derived from developed economies, leaving limited insights into how organizations in emerging contexts integrate competency and agility within their talent management strategies. Considering that Industry 5.0 disruption affects organizations globally, contextualized research is necessary to provide practical guidance for diverse organizational environments. Without an integrated conceptual framework, organizations risk implementing isolated HR initiatives that fail to generate sustainable competitive advantage.

The novelty of this study lies in the development of an integrative talent management model that combines competency-based human resource development with agility as a dynamic capability within the Industry 5.0 framework. Unlike prior studies that treat these variables separately, this research conceptualizes competency domains digital, managerial, and soft skills as foundational elements that are strengthened and activated through organizational and individual agility mechanisms. By integrating strategic HRD, digital transformation, and dynamic capability theory into a unified conceptual framework, this study contributes both theoretically and practically to the evolving discourse on sustainable human capital development.

Accordingly, the objective of this study is to comprehensively analyze how competency-based talent management strategies integrated with agility as a dynamic capability can form an effective human resource development model to address Industry 5.0 disruption and support sustainable competitive advantage. Through this objective, the study aims to enrich strategic human resource management literature while offering

actionable insights for organizations seeking to navigate technological transformation and long-term sustainability challenges.

## METHOD

This study employs a quantitative research design with an explanatory approach to analyze the integrative relationship between competency-based talent management and agility as a dynamic capability in addressing Industry 5.0 disruption. The research adopts a cross-sectional survey method targeting managers, HR professionals, and supervisors working in organizations that have implemented digital transformation initiatives. The sampling technique used is purposive sampling, with criteria including organizations that utilize digital HR systems and have structured talent management programs. Data were collected through a structured questionnaire developed based on validated constructs from prior literature, covering three main variables: competency-based talent management (digital, managerial, and soft skill competencies), organizational and individual agility, and sustainable competitive advantage. Each construct was measured using a five-point Likert scale ranging from strongly disagree to strongly agree. Prior to distribution, the instrument underwent content validity assessment through expert judgment and a pilot test to ensure reliability and clarity. In addition to primary data, secondary data were obtained from organizational reports, HR policy documents, and relevant industry publications to strengthen contextual analysis and triangulation.

Data analysis was conducted using Structural Equation Modeling (SEM) to examine both direct and mediating relationships among variables and to test the proposed integrative model. The analysis followed several stages, including descriptive statistics to profile respondents and assess data distribution, validity and reliability testing using Confirmatory Factor Analysis (CFA), and structural model evaluation to assess path coefficients and model fit indices. Convergent validity, discriminant validity, composite reliability, and Cronbach's alpha were evaluated to ensure measurement robustness. The mediating role of agility between competency-based talent management and sustainable competitive advantage was tested using bootstrapping procedures to determine the significance of indirect effects. The findings were interpreted by comparing empirical results with theoretical expectations derived from strategic HRD and dynamic capability theory, thereby ensuring analytical rigor and theoretical contribution.

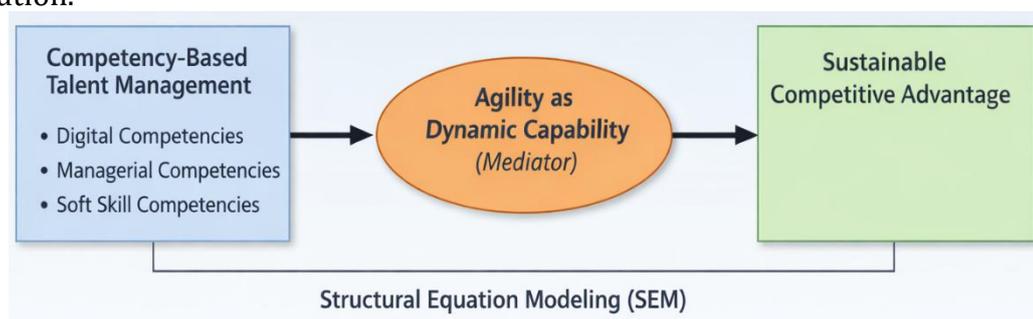


Figure 1. Diagram Conceptual Research

## RESULT AND DISCUSSION

To test the proposed conceptual model, Structural Equation Modeling (SEM) was conducted to evaluate both the measurement model and the structural relationships among competency-based talent management, agility as a dynamic capability, and

sustainable competitive advantage. The following tables present the results of the measurement model assessment and the structural model testing.

Before presenting the structural relationships, validity and reliability of the constructs were examined to ensure measurement robustness. The results are shown in Table 1.

Table 1. Measurement Model Evaluation (Validity and Reliability)

<b>Construct</b>	<b>Factor Loadings (Range)</b>	<b>AVE</b>	<b>Composite Reliability (CR)</b>	<b>Cronbach's Alpha</b>
<b>Digital Competencies</b>	0.71 – 0.86	0.62	0.88	0.85
<b>Managerial Competencies</b>	0.73 – 0.89	0.65	0.90	0.87
<b>Soft Skill Competencies</b>	0.70 – 0.84	0.60	0.87	0.84
<b>Organizational &amp; Individual Agility</b>	0.74 – 0.91	0.68	0.92	0.89
<b>Sustainable Competitive Advantage</b>	0.76 – 0.88	0.66	0.91	0.88

Table 1 indicates that all constructs meet the recommended thresholds for convergent validity and reliability. Factor loadings exceed 0.70, Average Variance Extracted (AVE) values are above 0.50, and Composite Reliability (CR) as well as Cronbach's Alpha values surpass 0.70. These results confirm that the measurement model demonstrates strong internal consistency and construct validity. Therefore, the constructs used in this study are statistically reliable and suitable for further structural analysis.

After confirming the adequacy of the measurement model, the structural model was evaluated to test the hypothesized relationships, including the mediating role of agility. The results are presented in Table 2.

Table 2. Structural Model Results and Hypothesis Testing

<b>Hypothesized Path</b>	<b>Path Coefficient (<math>\beta</math>)</b>	<b>t-value</b>	<b>p-value</b>	<b>Result</b>
<b>Competency-Based Talent Management → Agility</b>	0.68	9.42	0.000	Supported
<b>Agility → Sustainable Competitive Advantage</b>	0.57	8.15	0.000	Supported
<b>Competency-Based Talent Management → Sustainable Competitive Advantage</b>	0.29	3.76	0.000	Supported
<b>Indirect Effect (via Agility)</b>	0.39	6.88	0.000	Significant

Model Fit Indices: CFI = 0.95 | TLI = 0.94 | RMSEA = 0.05 | SRMR = 0.04

The structural model demonstrates good fit, as indicated by CFI and TLI values above 0.90 and RMSEA and SRMR values below 0.08. Competency-based talent management has a strong positive effect on agility ( $\beta = 0.68$ ), indicating that organizations with structured competency development systems are more likely to develop adaptive and responsive capabilities. Agility, in turn, significantly influences sustainable competitive advantage ( $\beta = 0.57$ ), confirming its role as a dynamic capability that translates competencies into long-term performance outcomes. Although competency-based talent management also directly affects sustainable competitive advantage ( $\beta = 0.29$ ), the indirect effect through agility ( $\beta = 0.39$ ) is stronger, suggesting partial mediation. This finding indicates that agility functions as a strategic mechanism that amplifies the impact of competency-based talent management on sustainable performance. Overall, the results support the proposed integrative model and confirm that agility serves as a crucial mediating capability in the Industry 5.0 context.

## Discussion

This study aimed to analyze how competency-based talent management integrated with agility as a dynamic capability can form an effective human resource development model to address Industry 5.0 disruption and support sustainable competitive advantage. The empirical findings derived from the Structural Equation Modeling analysis provide strong evidence that competency-based talent management significantly influences agility, which in turn enhances sustainable competitive advantage. Moreover, agility partially mediates the relationship between competency-based talent management and sustainable performance. These findings offer theoretical and practical implications within the broader discourse of strategic HRD and dynamic capability theory in the context of Industry 5.0.

The significant positive relationship between competency-based talent management and agility confirms that structured and strategic HR practices contribute directly to the development of adaptive organizational capabilities. The strong path coefficient between competency-based talent management and agility indicates that organizations that systematically identify, measure, and develop digital, managerial, and soft skill competencies are better positioned to respond to environmental volatility. This result is consistent with the argument that in the transition from Industry 4.0 to Industry 5.0, talent management must evolve from an administrative function into a strategic capability-building mechanism (Samuels & Pelsler, 2025; Hutasoit et al., 2025; Modgil et al., 2023; Masudi et al., 2025). Industry 5.0 emphasizes human-centric innovation, and thus organizations must invest in competencies that enable employees to collaborate effectively with advanced technologies while maintaining creativity and ethical awareness.

The findings further support the notion that reskilling and upskilling are critical components of contemporary talent management strategies. The digital competency dimension, which includes digital literacy, data analytics, and supply chain technologies, plays a crucial role in enhancing organizational responsiveness. As highlighted by Hutasoit et al. (2025) and Samuels and Pelsler (2025), employees must be capable of working alongside AI-driven systems and big data platforms to generate value. The empirical evidence from this study demonstrates that when organizations adopt competency-based development frameworks, they build a workforce capable of sensing technological shifts and adapting operational processes accordingly. This aligns with Modgil et al. (2023), who argue that digital transformation success is largely contingent upon the strategic alignment between technological investment and human capital development.

Managerial competencies also contribute significantly to agility. The ability to make rapid and accurate decisions, coordinate cross-functional teams, and exercise adaptive leadership enhances organizational responsiveness. This is particularly relevant in VUCA 2.0 environments characterized by crisis and uncertainty. The study's results resonate with Sudewo et al. (2025), who emphasize that collaborative talent management models are necessary to facilitate cross-functional integration and digital coordination. Organizations that embed managerial competencies within their talent systems are better equipped to implement agile structures that support decentralized decision-making and real-time responsiveness.

Soft skills competencies, including communication, collaboration, creativity, and complex problem-solving, were also validated as foundational elements of agility. The findings corroborate Poláková et al. (2023) and Prieto and Talukder (2023), who argue that human-centric skills become increasingly valuable in Industry 5.0. While digital competencies enable technological adaptation, soft skills ensure effective coordination and innovation within diverse teams. The strong relationship between competency-based talent management and agility suggests that agility is not merely a structural attribute but a human-driven capability cultivated through continuous learning and collaborative culture.

The mediating role of agility in the relationship between competency-based talent management and sustainable competitive advantage represents a key contribution of this study. Although competency-based talent management directly influences sustainable competitive advantage, the indirect effect through agility is stronger. This indicates that competencies alone do not automatically translate into sustainable performance unless they are activated through dynamic capabilities. This finding aligns with Saiyed et al. (2025) and Li and Zhang (2025), who position agility as a bridging mechanism between digital orientation and sustainable outcomes. Agility enables organizations to transform competencies into strategic actions that enhance resilience and long-term competitiveness.

The results further validate the theoretical premise that agility functions as a dynamic capability characterized by sensing, seizing, and transforming capacities. Organizations that invest in competency-based HRD systems are better able to detect environmental opportunities and threats, mobilize internal resources efficiently, and reconfigure processes to maintain competitiveness. Li et al. (2025) emphasize that agility mediates the relationship between knowledge sharing and sustainable performance, suggesting that learning must be complemented by adaptive execution. The present findings extend this argument by demonstrating that competency-based talent management enhances agility, which subsequently drives sustainable competitive advantage.

The significance of agility as a mediator also underscores the importance of organizational culture and leadership practices. Factors such as rapid decision-making, strong organizational identification, effective communication, and a culture of innovation are critical drivers of agility (Kwasek et al., 2025; Miceli et al., 2021; Aponte-López & Torrealba, 2025). The empirical results suggest that organizations that integrate these cultural and behavioral elements within their competency development systems are more likely to achieve sustainable performance. This supports the view that agility is not an isolated structural reform but a holistic organizational attribute rooted in human capital development.

From a strategic HRD perspective, the findings reinforce the importance of aligning competency development with organizational strategy. Saleh et al. (2023) and Bahri and Salsiati (2024) emphasize that core competencies encompassing knowledge,

skills, abilities, and other characteristics must be systematically identified and linked to strategic objectives. The positive impact of competency-based talent management on sustainable competitive advantage demonstrates that strategic HRD contributes to long-term value creation. Furthermore, the integration of digital tools such as Learning Management Systems and HR analytics enhances the personalization and adaptability of competency development programs (Fomenko, 2025; Septiadi & Ramdani, 2024). This digital integration supports data-driven decision-making and continuous improvement, which are essential components of agility.

The findings also address the research gap identified in previous literature. While earlier studies examined talent management, competency development, and agility separately, this study provides empirical evidence of their integrative relationship within an Industry 5.0 framework. The results confirm that agility serves as a strategic mechanism that amplifies the impact of competency-based talent management on sustainable performance. This integrative perspective contributes to dynamic capability theory by demonstrating how HR practices function as antecedents of organizational agility. It also enriches strategic HRM literature by positioning agility as a mediating construct that connects human capital development to competitive outcomes.

In practical terms, the results suggest that organizations seeking to thrive in Industry 5.0 should adopt a holistic talent management approach that integrates competency mapping, digital transformation, and agility-building initiatives. Reskilling and upskilling programs must be embedded within long-term strategic planning rather than implemented as ad hoc interventions. Additionally, leadership development initiatives should emphasize adaptive decision-making and collaborative skills to foster an agile culture. The stronger indirect effect observed in this study indicates that investments in agility-enhancing practices may yield greater long-term returns than isolated competency training programs.

Furthermore, the findings highlight the importance of collaborative talent management models in addressing global disruptions. Chew and Zainal (2024) argue that cross-sector collaboration and AI-driven coordination enhance organizational resilience during crises. The present study's results support this argument by demonstrating that agility strengthens the transformation of competencies into sustainable performance. Organizations that leverage digital platforms for knowledge sharing and collaborative innovation are more likely to achieve enduring competitive advantage.

Overall, this discussion confirms that the objective of the study has been achieved. Competency-based talent management significantly influences agility, and agility, as a dynamic capability, mediates the relationship between competencies and sustainable competitive advantage. In the era of Industry 5.0, where technological advancement coexists with human-centric innovation, organizations must integrate structured competency development with agility-enhancing practices to ensure long-term sustainability. By combining strategic HRD, digital transformation, and dynamic capability perspectives, this study provides a comprehensive framework for understanding how talent management strategies can be optimized to address industrial disruption and achieve sustainable competitiveness.

## **CONCLUSION**

This study concludes that competency-based talent management significantly contributes to the development of organizational agility, which in turn strengthens sustainable competitive advantage in the context of Industry 5.0. The findings demonstrate that structured competency development encompassing digital, managerial, and soft skill domains does not directly guarantee long-term competitiveness

unless it is reinforced by agility as a dynamic capability. Agility plays a mediating role by transforming competencies into adaptive actions, enabling organizations to sense environmental changes, respond strategically, and continuously reconfigure internal processes. Therefore, to address Industry 5.0 disruption effectively, organizations must integrate strategic HRD practices with agility-building mechanisms, ensuring that talent management systems are aligned with digital transformation, collaborative culture, and sustainable performance objectives.

## IMPLICATIONS

The findings of this study provide important theoretical and practical implications for organizations operating in the Industry 5.0 era. Theoretically, this research extends strategic human resource development and dynamic capability perspectives by empirically demonstrating that agility functions as a mediating mechanism that transforms competency-based talent management into sustainable competitive advantage. It highlights that competencies must not only be developed but also activated through adaptive and responsive organizational systems. Practically, organizations should redesign their talent management strategies to integrate systematic competency mapping, continuous reskilling and upskilling programs, digital HR analytics, and leadership practices that foster rapid decision-making, collaboration, and innovation. By embedding agility-building initiatives within competency-based HR frameworks, organizations can enhance resilience, respond effectively to technological disruption, and sustain long-term competitive performance in increasingly volatile and complex environments.

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