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Mapping Strategic HR Competencies for Sustainable Construction: A Global Bibliometric Perspective with Implications for Malaysia (2017–2025)

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Abstract

This study explores the global landscape of strategic human resource (HR) competencies in the construction sector from 2017 to 2025, with a particular focus on sustainable HRM practices and their implications for Malaysia's construction industry. Using bibliometric analysis, a total of 244 peer-reviewed articles from the Web of Science database were examined and visualized via Cite Space (v6.2.R2) to uncover co-citation networks, emerging themes, and keyword clusters. The analysis identified six dominant clusters: (1) Sustainable human resource management practice , (2) Work Engagement, (3) Talent Management, (4) Technical Competencies, (5) Dynamic Capability framework and (6) Human resource information systems. Findings highlight a shift toward integrating ESG principles, resilience-based workforce planning, and inclusive talent strategies into HR practices. While global discourse increasingly emphasizes sustainable and digital-ready HR competencies, Malaysian construction literature exhibits a critical lag in addressing these evolving priorities. Gaps were identified particularly in small-to-medium enterprises (SMEs), where limited resources hinder the adoption of strategic HRM frameworks aligned with national construction goals. This study provides a comprehensive mapping of scholarly contributions and proposes context-specific implications for stakeholders in Malaysia. For policymakers, the results underscore the urgency of embedding HR competency frameworks into national sustainability agendas. For practitioners, the findings offer insight into aligning workforce strategies with project performance and regulatory compliance. For academia, the study points to emerging interdisciplinary research opportunities at the intersection of HRM, sustainability, and construction innovation.

Keywords: Strategic HRM, Sustainable HR Practices, Bibliometric Analysis, ESG, HR Competencies

Introduction

The construction industry plays a pivotal role in national development and economic growth, yet it faces growing pressure to evolve in response to global calls for sustainability, talent scarcity, and digital integration. In this context, human resource (HR) management is no longer confined to administrative functions but has become a strategic lever in driving organizational resilience and competitiveness. Strategic HR competencies defined as the knowledge, skills, and capabilities that enable HR functions to align with long-term business objectives are increasingly essential, particularly in complex, project-based industries like construction.

Malaysia's construction sector, characterized by its reliance on labor-intensive practices and foreign manpower, is undergoing transformation under the national Construction Industry Transformation Programme (CITP) and sustainability-linked policy initiatives. However, the adoption of strategic HRM practices remains uneven, with many firms especially SMEs facing challenges in aligning HR capabilities with evolving environmental, regulatory, and market expectations. Existing literature reveals gaps in the identification, development, and contextualization of HR competencies tailored for sustainable construction in Malaysia.

To address these gaps, this study undertakes a global bibliometric analysis of scholarly publications from 2017 to 2025 to map the evolution of strategic HR competencies in the construction industry. By visualizing thematic clusters and intellectual trends through CiteSpace, this research not only synthesizes global insights but also identifies practical implications for Malaysian stakeholders. In doing so, it contributes to the discourse on sustainable HRM by offering an evidence-based foundation for aligning talent strategies with industry-specific sustainability goals.

Literature Review

The evolution of strategic human resource management (SHRM) competencies is increasingly shaped by global sustainability imperatives, rapid digital transformation, and expanding regulatory complexity (Shah et al., 2023; Nankervis & Cameron, 2023). In high-impact sectors such as construction, HR professionals are now required to drive organizational resilience, ESG compliance, and innovation rather than simply execute administrative tasks (Musarat et al., 2024; Boon et al., 2022).

Globally, SHRM literature underscores that aligning HR practices with organizational goals is crucial for competitiveness and project success (Boon et al., 2022). However, the construction industry faces acute challenges, including labor shortages, compliance burdens, and fragmented HR systems. These issues are especially pronounced in Malaysia, where many SMEs lack formal HR frameworks and struggle to implement best practices (Chieng, 2021). Compared to regional leaders such as Singapore and Australia, Malaysia's construction sector shows slower adoption of digital HRM and ESG-aligned practices (Nankervis & Cameron, 2023).

Talent management remains a critical theme, as the sector relies heavily on unskilled foreign labor, contributing to a persistent skills gap. Scholars advocate robust talent pipelines, inclusive hiring, and ongoing workforce development to ensure industry resilience (Zaini et al., 2024; Farrukh et al., 2022). At the same time, compliance with occupational safety, labor

standards, and sustainability reporting requires HR professionals to develop legal, data management, and ethical governance skills. National initiatives like the Construction Industry Transformation Programme (CITP) have raised the bar for competency in these domains.

Change management is now recognized as a vital HRM competency, with digitalization, remote work, and green certification initiatives demanding active HR leadership in upskilling and organizational culture change. Literature shows that HR-driven change agents are central to enabling strategic renewal and innovation readiness (Nankervis & Cameron, 2023).

Despite advanced practices among large Malaysian contractors, many SMEs lag in sustainability integration, digital adoption, and the use of competency frameworks. This reveals a broader need for national policies and targeted upskilling programs tailored to SME realities (Musarat et al., 2024).

Theoretically, this study draws on the Ulrich HR Competency Model (Ulrich, 2008; Ulrich et al., 2010), Resource-Based View (RBV) (Barney, 1991), and the Dynamic Capabilities Framework (Teece et al., 1997), which together explain how HR competencies can drive sustainable organizational advantage. However, bibliometric reviews point to a persistent lack of research on the application of these models in emerging economies' construction sectors (Shah et al., 2023). This study addresses this gap by systematically mapping global HRM competency trends and providing contextualized insights for Malaysia.

Methodology

This study adopts a bibliometric analysis approach to systematically examine global trends in strategic human resource management (HRM) competencies, with a specific lens on sustainable HRM practices in the construction industry. The bibliometric technique enables the identification of key themes, scholarly impact, and structural patterns in the research field by analyzing metadata from peer-reviewed literature.

Data Source and Search Strategy

The primary data source was the Web of Science (WoS) Core Collection, selected for its comprehensive indexing of high-impact, peer-reviewed publications. The search string employed included the keywords "HR competencies," "strategic HRM," "sustainability," and "construction industry," applied to the title, abstract, and keywords fields. The search was confined to the period from 2017 to 2025 to capture recent developments and post-pandemic shifts. Only journal articles published in English were retained, yielding a total of 244 documents for analysis.

Citation Network Visualization of HR Competency Research (2017–2025)

Figure 1 illustrates the co-citation network of HR competency research in the construction sector, generated using CiteSpace for the period 2017 to 2025. Each node represents a key scholarly publication, with node size proportional to citation frequency, signifying the influence of each work within the academic community. The curved lines denote co-citation relationships, indicating how often two documents are cited together and revealing the intellectual connectivity within the field.

The analysis, using the Log-Likelihood Ratio (LLR) clustering method, identified six prominent thematic clusters:

#0 Sustainable human resource management practice #1 Work engagement
#2 Talent management
#3 Technical competencies
#4 Dynamic capability framework
#5 Human resource information systems

Notably, foundational publications such as Hair JF (2019), Guest DE (2017), and Shet SV (2021) emerged as central nodes, bridging multiple thematic areas and serving as intellectual anchors in the network. The visualization demonstrates the field's evolution from traditional HRM topics towards more contemporary concerns, such as digitalization, ESG integration, and workforce agility. The density and interconnectedness of clusters indicate that research on HR competencies is not only multidisciplinary but also increasingly convergent on topics like sustainable practices and technical capability development, which are vital for addressing the current and future needs of the construction industry.

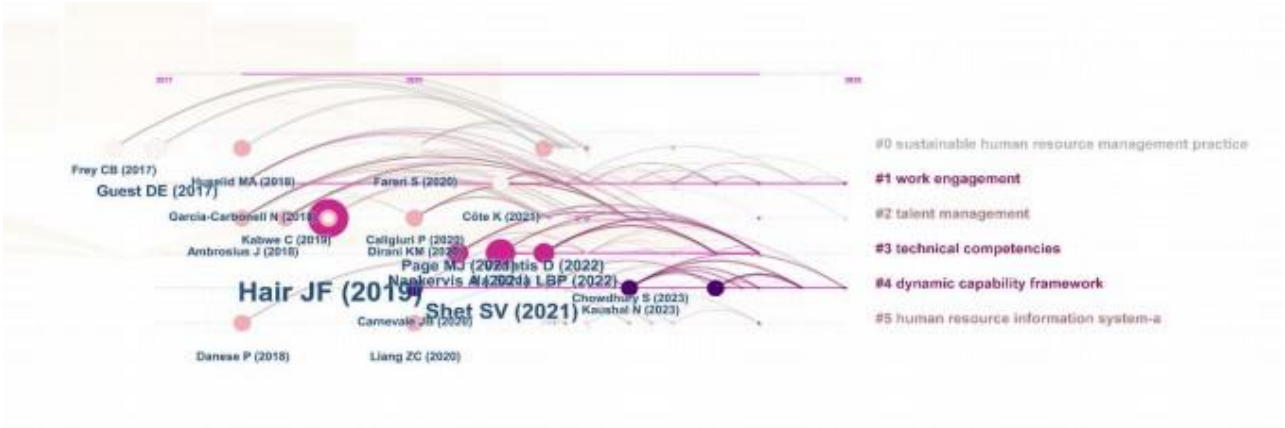


Figure 1: Citation Network Visualization of HR Competency

Data Processing and Analysis Tool

The dataset was exported in plain text format and analysed using Cite Space (v6.2.R2), a prominent tool for bibliometric and scientific mapping analysis. CiteSpace facilitates the exploration of intellectual structures and research dynamics by generating co-citation networks, keyword co-occurrence maps, and temporal burst analyses. The analytical process was systematically executed in multiple stages. First, Document Co-Citation Analysis (DCA) was conducted to uncover the most frequently cited publications, thereby identifying foundational literature and intellectual milestones within the field. Second, Keyword Co-Occurrence and Cluster Analysis were employed to examine the conceptual structure of the domain, enabling the detection of thematic clusters and the identification of emerging research areas. Lastly, Citation Burst Detection was used to capture papers that experienced a sudden surge in citations over a specific period, indicating shifting scholarly attention and evolving research trends. These combined techniques provided a comprehensive understanding of the strategic HRM competency landscape and its progression across the selected time frame.

Clustering Procedure

Six major thematic clusters were identified using Log-Likelihood Ratio (LLR) for label generation. The largest cluster (#0), labeled "Sustainable HRM Practices," consisted of

publications emphasizing ethical talent strategies, environmental integration, and competency frameworks aligned with ESG objectives.
Other clusters covered themes such as talent agility, regulatory compliance, and workforce digitization readiness.

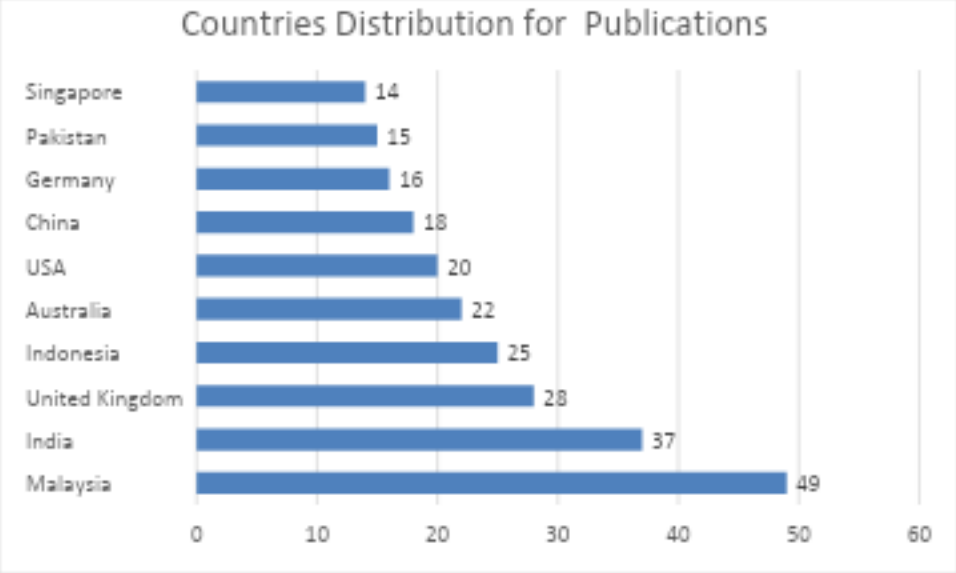
Quality Assurance Measures
To ensure analytical rigor and enhance the reliability of findings, a series of preprocessing and validation procedures were undertaken prior to data interpretation. These included the removal of duplicate records, manual screening of abstracts to ensure thematic relevance, and temporal slicing to trace the evolution of research topics over distinct time intervals. Additionally, network visualizations such as keyword co-occurrence maps and citation tree diagrams were generated to support interpretative clarity. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework was employed to guide the systematic identification, screening, eligibility assessment, and inclusion of articles. This framework ensured methodological transparency and reproducibility in the bibliometric workflow.

Results
Distribution and Temporal Coverage of HR Competency Research
Table 1
Citation Distribution and Temporal Coverage of HR Competency Research

ıster ID	**HR Competencies Keywords**	**itation Count**	**itation Years Covered**
#0	Sustainable Human Resource Management Practice	21	2017–2025
#1	Work Engagement and Arrangements	23	2017–2025
#2	Talent Management	20	2017–2025
#3	Technical Competencies	18	2017–2025
#4	Dynamic Capability Framework	18	2017–2025
#5	Human Resource Information System (HRIS)	16	2017–2025

World Map: Geographic Distribution of Publications

Countries Distribution of Publications



Discussion

Discussion of Findings

This study provides a comprehensive mapping of strategic HR competencies from 2017 to 2025, revealing six key thematic clusters that reflect the evolving priorities of HRM globally. The results demonstrate a clear shift from traditional administrative functions toward digital transformation, sustainability integration, and workforce adaptability. Notably, themes such as work engagement, talent empowerment, HRIS development, and ESG alignment have emerged as dominant research fronts. This shift mirrors the increasing expectations for HR professionals to serve not merely as support functions but as strategic partners capable of driving innovation and resilience.

From a theoretical lens, the findings affirm the applicability of the Ulrich HR Competency Model, particularly in its emphasis on HR as credible activists, change champions, and capability builders. Simultaneously, the Resource-Based View (RBV) and Dynamic Capabilities Framework provide a strong explanatory basis for the observed trends. The rise of digital HR tools, strategic workforce analytics, and ESG-aligned planning suggests that firms increasingly perceive HR competencies as core intangible assets contributing to sustained competitive advantage.

For the Malaysian construction sector, these global trends expose critical competency gaps, particularly among SMEs. While large firms such as Gamuda and MRCB are advancing ESG frameworks and HR digitalization, smaller firms often lack the institutional capacity to adopt such practices. The reliance on low-skilled labor, absence of structured competency models, and weak alignment with national transformation programs such as CITP underscore systemic vulnerabilities.

Importantly, this research adds empirical weight to the call for more inclusive and scalable HRM interventions tailored to local contexts. The bibliometric insights, combined with practitioner interviews, point to the urgent need for cross-sectoral collaboration, continuous upskilling, and regulatory alignment. The discussion affirms that sustainable HR development in Malaysia's construction industry must balance global competency trends with localized support mechanisms bridging the policy-practice-research gap that currently hinders strategic HR maturity.

Limitations and Future Research

This study contributes to strategic HRM literature by demonstrating how global competency trends—such as ESG integration, HR analytics, and dynamic capability alignment—are reshaping talent strategies in the construction industry. The integration of Ulrich's HR Competency Model with RBV and Dynamic Capabilities offers a theoretical lens to understand how HR can evolve from support function to strategic driver.

For practitioners and policymakers in Malaysia, this research signals an urgent need to embed HR capabilities into national transformation frameworks such as the CITP. Practical implications include establishing ESG-linked training incentives, encouraging digital HR adoption among SMEs, and forming stronger university-industry HR development collaborations.

Limitations include reliance on WoS-indexed literature and limited real-time implementation validation. Future studies could incorporate case studies, longitudinal analysis, and comparative benchmarking across ASEAN countries to further validate and localize the proposed HR competency framework.

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