

Deconstructing Hybrid Work: Technostress, Cognitive Permeability, And The Urgency Of E-Leadership

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ABSTRACT

The radical transformation toward hybrid work models post-pandemic has redefined organizational boundaries while simultaneously triggering technostress, which threatens employee well-being. This study aims to map the drivers, impacts, and mitigation strategies of technology-induced stress in hybrid work environments through a scoping review approach. Following the PRISMA-ScR protocol, 65 peer-reviewed articles (2019-2025) were synthesized from the Scopus database. Findings indicate that the primary antecedents of technostress are rooted in techno-invasion, the "always-on" culture, and information overload, which trigger unique psychophysiological strains such as videoconferencing fatigue. This study offers theoretical novelty by reconceptualizing the Job Demands-Resources (JD-R) model, positioning technology as a paradoxical entity acting as both a resource and a stressor. The synthesis emphasizes the critical role of virtual leadership (E-Leadership) and "Right to Disconnect" policies as primary buffers in mitigating the negative impacts of digitalization. The study concludes that organizational sustainability in the hybrid era depends on a managerial paradigm shift from presence-based monitoring to the protection of employees' cognitive energy capacity.

INTRODUCTION

The massive acceleration of digital transformation has fundamentally altered the organizational landscape, forcing a structural shift toward flexible and hybrid work arrangements. Within the Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2007), this spatiotemporal flexibility was initially conceptualized as a valuable job resource enhancing employee motivation and work engagement.

However, post-pandemic empirical reality reveals a theoretical anomaly. Absolute dependence on ICT to sustain hybrid operations has triggered an "always-on" culture, in which protective boundaries between professional obligations and personal life have grown increasingly blurred (Mdhluli, 2025). Boundary Theory (Ashforth et al., 2000) explains that

individuals continuously engage in micro role transitions between work and domestic domains. In the hybrid context, technology has become a medium of invasion (techno-invasion) rendering cognitive and spatial boundaries highly permeable, giving rise to technostress—persistent psychological strain from individuals' inability to adapt to continuously evolving technological demands (Baurai et al., 2025; Muhamad et al., 2025).

A critical review of contemporary literature (2019-2025) reveals significant inconsistencies and theoretical fragmentation. Bondanini et al. (2025) describe this as the "connectivity paradox". Some researchers focus on technology's hindrance aspects (Buzas et al., 2025); others examine videoconferencing fatigue (Abramova & Gladkaya, 2025); while others explore role conflict (Domagalska-Gredys & Sroka, 2025; Popovac et al., 2025).

The most critical knowledge gap is the absence of a comprehensive synthesis mapping how technostress operates as a unique biological and psychological fatigue mechanism within hybrid work design (Girardi et al., 2025). This study aims to: (1) identify the root determinants; (2) dissect the paradoxical impact on worker well-being; and (3) map effective multi-level mitigation strategies.

RESEARCH METHODS

This study employs a Scoping Review approach, adopting the methodological framework of Levac et al. (2010) and further refined by the Joanna Briggs Institute (JBI). Unlike conventional literature reviews, this approach enables synthesis of evidence from diverse study designs to identify key concepts, theories, and knowledge gaps in a complex topic.

Primary data search was conducted through the Scopus database, selected for its comprehensive and rigorous global citation indexing. Search strings were constructed using Boolean operators (AND, OR, NOT) with a "broad-yet-specific" approach capturing the full spectrum of modern work nomenclature.

Inclusion criteria comprised: (1) peer-reviewed journal articles; (2) publication period 2019-2025; (3) English language and open access; and (4) professional employees in hybrid or remote work settings. Exclusions covered students, educators, and clinical contexts. The selection adhered to the PRISMA-ScR protocol across four stages: identification (743 documents), temporal screening (633), metadata screening (423), and eligibility assessment yielding 65 final documents for synthesis.

Data analysis proceeded through two primary techniques: (1) bibliometric and descriptive analysis to map publication trends and sectoral vulnerability; and (2) qualitative thematic synthesis organizing findings into three dominant clusters: digital postulates a dichotomy: job demands exhaust energy, while job resources facilitate goal achievement. In the traditional paradigm, autonomy, flexibility, and access to ICT were universally categorized as resources serving as stress buffers. Contemporary hybrid work literature demands a conceptual revision: technology in the hybrid ecosystem holds a "paradoxical dual status." Table 1 synthesizes the paradigm shift in the JD-R Model within the hybrid work context.

Tabel 1. *Comparative Synthesis: Paradigm Shift in the JD-R Model within the Hybrid Work Context*

Dimension of Analysis	Traditional Perspective	Contemporary Perspective (Hybrid Work)	Empirical References
Position of Technology (ICT)	Static pure Resource facilitating efficiency and flexibility.	Dynamic Paradoxical Dual Entity: resource while simultaneously triggering new techno-invasion demands.	Bondanini et al. (2025)
Primary Demand Sources	Physical workload and time pressure in the office.	Information processing demands, always-on culture, and videoconferencing fatigue.	Xie & Yang (2025); Abramova & Gladkaya (2025)
Buffer Mechanisms	Work autonomy and general social support from colleagues.	Meta-Resources: Digital literacy, boundary control ability, and E-Leadership.	Girardi et al. (2025)
Well-being Success Criteria	Maximizing physical recovery time outside office hours.	Maximizing cognitive detachment from the corporate digital ecosystem.	Buzas et al. (2025)

RESULTS AND DISCUSSION

Antecedents: Digital Demand Mechanisms in Hybrid Work

The synthesis confirms that the primary drivers of technostress are rooted not in hardware failures but in the structure of connectivity itself. Technology invasion (techno-invasion) and the always-connected culture emerged as the most pervasive antecedents. Mdhluli (2025) conceptualizes this as the "peril of perpetual connectivity"—employees experience a psychological obligation to remain responsive beyond standard working hours, a structural problem driven by mobile technology features that anchor employees to the digital workplace regardless of physical location.

Beyond connectivity, technological complexity and information overload constitute significant stressors. Xie and Yang (2025) elaborate that "information processing demands" grow more burdensome when organizational support is inadequate, triggering "digital inadequacy" among remote workers—a sense of incompetence facing rapidly changing digital tools.

Analysis further reveals that employees do not perceive all digital demands negatively. Drawing on Buzas et al. (2025), a distinction emerges between antecedents, dualistic impacts on well-being and performance, and multi-level mitigation strategies.

Evaluating Mitigation Strategies: Multi-Level Synergy

Addressing technostress in hybrid environments requires a transition from generic wellness programs toward a deliberate redesign of the organization's digital architecture. Effective mitigation must operate across three interdependent levels.

At the structural level, formalizing digital boundaries through legal policy represents the primary protective instrument. Agalliu and Ibrahim (2025) argue that "Right to Disconnect" policies must be internalized as core cultural values to halt the colonization of private space by digital demands. HR departments are encouraged to leverage AI-based workload analytics to proactively prevent burnout.

At the managerial level, leadership emerges as the most critical buffer. Leaders demonstrating "Digital Empathy"—sensing and alleviating subordinates' digital burdens—are key to team resilience. Empirical evidence shows supervisory support is more effective than peer support in reducing stress hormone levels among remote workers. Managers should implement an "Asynchronous-First" communication protocol explicitly permitting teams to refrain from responding immediately to non-urgent messages. challenge stressors (demands that, when overcome, enhance career growth and satisfaction) and hindrance stressors (demands obstructing autonomy and performance, such as digital bureaucracy or intensive monitoring), which directly reduce engagement and innovative voice behavior.

The Paradox of Impact: Productivity vs. Psychophysiological Fatigue

A critical paradox emerges: while digital tools enable work continuity and flexibility, they simultaneously drain human energy reserves. Abramova and Gladkaya (2025) provide empirical evidence that videoconferencing fatigue is driven by "mirror anxiety" arising from the self-view feature and the high cognitive load required to process nonverbal cues in digital spaces. This explains why hybrid workers frequently report high exhaustion despite a seemingly static physical workload.

The impact of technostress is not merely perceptual—it has been physiologically verified. Through hair cortisol analysis, Girardi et al. (2025) demonstrate a direct biological link between technostress creators and long-term stress responses. This reinforces that digital intensity is a primary predictor of mental health decline and occupational burnout, particularly in high-pressure sectors such as healthcare. Without meaningful work design, digital flexibility can trigger alienation and a decline in employee engagement.

Critical Analysis: The Sustainability Gap in Modern Management

A comprehensive synthesis reveals a troubling "sustainability gap" in modern management practice. Organizations frequently apply conventional HRM models to a radically digitalized reality. Traditional wellness programs prove insufficient because digital stressors are inherently invasive and cognitive rather than physical. The core problem is not a lack of rest, but a failure of cognitive detachment. Without structural guardrails, the autonomy promised by hybrid work mutates into an instrument of covert working-hour exploitation.

In the cultural context of many Asian regions, including Indonesia, this challenge is compounded by strong norms of deference and hierarchy. Employees often feel uncomfortable disconnecting digitally for fear of being perceived as lacking dedication. This study therefore argues that digital empathy in leadership is no longer supplementary—it is a core competency determining organizational resilience. Sustainability in the hybrid era depends on a socio-technical recalibration: shifting from time-based monitoring toward the protection of employees' cognitive capacity as a strategic asset.

CONCLUSION AND SUGGESTIONS

Conclusion

This study has dissected the dynamics of technostress in the hybrid work ecosystem through a scoping review of 65 internationally reputed articles (2019-2025). Three fundamental conclusions advance HRM discourse in the digital age:

First, the Dual Status of Technology as a "Double-Edged Sword": Technology has transformed from a supportive instrument into an invasive source of demands. Autonomy in hybrid work is illusory without structural protection of employees' private space. The primary stress drivers are rooted in the dissolution of spatiotemporal boundaries and information processing complexity that exceeds human cognitive capacity.

Second, the Productivity Paradox Mechanism: Digital collaboration tools increase connectivity while simultaneously depleting psychophysiological energy. Videoconferencing fatigue and elevated long-term cortisol levels demonstrate that hybrid productivity is frequently achieved at an unsustainable health cost.

Third, the Urgency of E-Leadership: Technostress mitigation cannot be accomplished through formal policy alone or individual resilience. The quality of E-Leadership is the determining variable. Leaders function as "circuit breakers" who determine whether digital demands become motivating challenges or burnout-inducing hindrances. Organizational sustainability in the hybrid era depends on a paradigm shift: from presence-based oversight to the protection of cognitive energy as primary organizational capital.

Suggestion

(1) Re-Architect Digital Communication Protocols: Organizations must abandon the assumption that rapid response signals dedication. Adopt an "Asynchronous-First" protocol—designate uninterrupted time windows for cognitively demanding deep work without the pressure of instant replies.

(2) Invest in Digital Wellness Literacy for Leaders: The most impactful investment is in developing Digital Empathy among managers. Leaders should be trained to detect virtual fatigue signals within their teams. Practical strategies include "No-Meeting Fridays" and capping virtual meetings at 45 minutes to prevent videoconferencing fatigue.

(3) Formalize Right-to-Disconnect Policies: Establish internal regulations protecting employees' private space as mutually agreed protocols. Examples include deactivating

notification servers after designated working hours or providing compensatory time off for emergency tasks handled outside operational hours.

(4) Redefine Organizational Culture - Trust Over Surveillance: Organizations must make a deliberate shift from a presence-based control culture to an output-based culture grounded in trust. Technostress frequently arises not from the tools themselves but from the sense of continuous monitoring via messaging app status indicators. Granting employees genuine autonomy over their digital time management builds a stronger foundation for long-term organizational resilience.

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