

From Technostress to Techno-Recovery: Strategic HRM Job Resources to Reduce Digital Burnout in the JD-R Model

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ABSTRACT

The rapid digitalization of work has intensified technostress and increased the risk of digital burnout, particularly in knowledge-intensive and technology-driven organizations. Drawing on the Job Demands–Resources (JD-R) model, this study develops and tests a conceptual framework in which technostress operates as a key job demand, digital burnout as a central health-impairment outcome, and a bundle of strategic human resource management (HRM) job resources framed as “techno-recovery” resources to buffer these effects. Techno-recovery resources are defined as integrated organizational, social, and technological practices that support psychological detachment, digital boundary control, and recovery from technology-driven stress. Using a quantitative survey design among employees in digitally intensive organizations, this study proposes the use of structural equation modeling to test the mediating role of digital burnout between technostress and outcomes (work engagement and turnover intention), and the moderating role of techno-recovery resources within the JD-R framework. Although the empirical patterns are presented conceptually for illustrative purposes, the model is grounded in prior evidence on technostress, recovery experiences, and HRM in digital contexts. This study contributes to the literature by (1) positioning technostress and techno-recovery within an extended JD-R model, (2) specifying strategic HRM levers to reduce digital burnout, and (3) offering a measurement framework for future empirical work in emerging economies. The rapid digitalization of work has intensified technostress and increased the risk of digital burnout, particularly in knowledge-intensive and technology-driven organizations. Drawing on the Job Demands-Resources (JD-R) model, this study develops and tests a conceptual framework in which technostress operates as a key job demand, digital burnout as a central health-impairment outcome, and a bundle of strategic human resource management (HRM) job resources framed as “techno-recovery” resources to buffer these effects. Techno-recovery resources are defined as integrated organizational, social, and technological practices that support psychological detachment, digital boundary control, and recovery from technology-driven stress. Using a quantitative survey design among employees in digitally intensive organizations, this study proposes the use of structural equation modeling to test the mediating role of digital burnout between technostress and outcomes (work engagement and turnover intention), and the moderating role of techno-recovery resources within the JD-R framework. Although the empirical patterns are conceptually presented for illustrative purposes, the model is grounded in prior evidence on technostress, recovery experiences, and HRM in digital contexts. This study contributes to the literature by (1) positioning technostress and techno-recovery within an extended JD-R model, (2) specifying strategic HRM levers to reduce digital burnout, and (3) offering a measurement framework for future empirical work in emerging economies.

Keywords: Techno, Stress, Recovery, Digital

INTRODUCTION

The acceleration of digital transformation has fundamentally reshaped how employees work, interact, and experience their organizations. Digital platforms, mobile devices, and algorithmic systems now permeate every HRM function, from e-recruitment and e-learning to continuous performance management and advanced workforce analytics. While these technologies promise efficiency and agility, they also generate new forms of strain, often conceptualized as technostress, which refers to the stress that individuals experience due to the use of information and communication technologies (ICTs). Technostress encompasses overload, complexity, invasion, insecurity, and uncertainty associated with digital tools and processes (Mansuroğlu & Smith, 2026).

Within this technologically saturated environment, a specific form of strain, digital burnout, has gained increasing prominence. Digital burnout refers to a state of emotional exhaustion, cognitive fatigue, and cynicism specifically associated with chronic exposure to digital work demands, such as constant connectivity, information overload, and platform-based monitoring. As organizations in both advanced and emerging economies heavily invest in digitalization, HR departments are confronted with a paradox: the same technologies that enable flexible, data-driven HRM can also erode employee well-being, engagement, and retention if they are implemented without adequate job resources and recovery opportunities (Susanto et al., 2025).

The Job Demands Resources (JD-R) model offers a powerful theoretical lens for understanding this paradox. In its canonical form, the JD-R model distinguishes between job demands physical, psychological, social, or organizational aspects of the job that require sustained effort and are associated with certain costs—and job resources, which are aspects of the job that help achieve work goals, reduce demands, or foster personal growth and development. High job demands trigger a health-impairment process leading to burnout, whereas abundant job resources stimulate a motivational process leading to work engagement and positive outcomes. Within this framework, technostress can be conceptualized as a specific job demand that depletes energy and fuels digital burnout, whereas properly designed technology-related resources may serve as buffers that protect employees and promote sustainable performance (Pansini et al., 2023).

Recent scholarship has begun to position technostress explicitly within the JD-R perspective, showing that ICT-related job demands are associated with reduced well-being, performance, and engagement, but their effects can be alleviated by technology-related job resources such as literacy facilitation, technical support, and participative digital change. Parallel research on recovery experiences demonstrates that the extent to which employees can detach psychologically from work, relax, experience mastery, and feel control during non-work time significantly predicts lower burnout and better mental health outcomes. Importantly, these recovery experiences are undermined when employees engage in work-related ICT use after hours, blurring the boundaries between work and home and prolonging exposure to digital demands (Robertson & Byram, 2025).

However, these two bodies of literature technostress and recovery have evolved largely in parallel. The concept of digital burnout is typically examined either as an outcome of technostress within JD-R studies or as a correlate of inadequate recovery experiences in occupational health psychology research. What remains underdeveloped is an integrated HRM-oriented framework that articulates how strategic HRM practices can operate as job resources to transform “technostress” into “techno-recovery.” Such a framework would focus not only on reducing negative technological demands but also on designing technology-enabled systems that actively support recovery, boundary control, and well-being (Hermawati, 2025).

This study addresses this gap by advancing the notion of “techno-recovery” as a strategic HRM job resource bundle and embedding it within the JD-R model. Techno-recovery is defined here as an integrated set of policies, practices, and technological configurations that enable employees to (1) manage their digital boundaries, (2) protect non-work time from intrusive work-related ICT use, and (3) engage in restorative experiences during and after work. Examples include right-to-disconnect policies, configurable notification settings, recovery-friendly workload planning, micro-break prompting systems, digital well-being dashboards, and HR-facilitated training for digital self-regulation (Sarkar et al., 2025).

In many organizations, particularly in fast-growing digital sectors and startups, the norm of “always on” communication and hustle culture has normalized excessive digital availability and late-night messaging among employees. This is especially salient in urban, service-oriented economies, where digital business models and remote or hybrid work are prevalent. Employees in such contexts report tensions between productivity expectations, algorithmic performance measurement, and their ability to psychologically detach from work. The emergence of digital burnout is thus not merely an individual resilience problem but a structural HRM challenge that requires systemic job resource interventions rather than ad hoc wellness programs (Adias et al., 2025).

Strategic HRM scholarship has long argued that human capital can be a source of sustained competitive advantage when supported by coherent HR systems that enhance ability, motivation, and opportunity (AMO). In the digital era, this strategic orientation must be expanded to explicitly include “recovery capability” as a core dimension of the HR architecture. Employees’ ability to recover cognitively and emotionally from intensive digital work can be seen as a strategic asset that influences innovation, service quality, and retention. Embedding techno-recovery resources in HR systems therefore represents a shift from reactive stress management to proactive, design-oriented well-being management (Westover, 2025).

Against this backdrop, the present study has three main objectives: First, it conceptualizes technostress as a key job demand and techno-recovery as a multidimensional job resource within an extended JD-R model that explains digital burnout and downstream outcomes, such as work engagement and turnover intention. Second, it develops a quantitative measurement model specifying how technostress, techno-recovery, and digital burnout can be operationalized in survey research, including HRM-relevant dimensions such as digital workload control, supportive e-leadership, and recovery-supportive HR policies. Third, it outlines and illustrates a set of empirical relationships, grounded in prior evidence, that articulate how techno-recovery job resources reduce the impact of technostress on digital burnout and, through this pathway, foster more sustainable forms of digital work (Rehabeam & Kustiawan, 2025).

The remainder of this article is structured as follows. The next section reviews the literature on technostress, digital burnout, JD-R theory, strategic HRM, and recovery experiences and develops the hypotheses. The methodology section then presents a quantitative research design suitable for testing the proposed model in digitally intensive organizations, with attention to measurement, sampling and analysis strategies. The subsequent results section illustrates how such a model can be empirically evaluated and how the key constructs and relationships can be summarized quantitatively in line with JD-R theory and prior findings. The discussion interprets these patterns, highlights their theoretical and practical implications, and identifies avenues for future research. The conclusion synthesizes the contributions and reiterates the strategic importance of moving from technostress to techno-recovery in contemporary HRM.

RESEARCH METHOD

This study adopts a quantitative, cross-sectional survey design aimed at empirically testing the proposed techno-recovery model within the JD-R framework. This design is suitable for examining the relationships among latent constructs such as technostress, techno-recovery resources, digital burnout, work engagement, and turnover intention in a relatively large employee population. Structural equation modeling (SEM) or partial least squares SEM (PLS-SEM) is proposed as the primary analytical technique because of its capacity to handle complex latent variable models and moderation–mediation structures (Arikunto, 2017).

The target population consisted of full-time employees working in digitally intensive organizations, such as ICT firms, digital startups, online service providers, and organizations that rely heavily on digital platforms for core business and HRM processes. Focusing on digitally intensive settings ensures sufficient variance in both technostress and exposure to HR-related digital practices.

A multistage sampling approach can be employed. First, organizations were purposively selected based on criteria such as the extent of ICT use, the presence of digital HR systems, and the willingness to participate in research. Within each participating organization, employees were invited to complete an online survey distributed via corporate email, collaboration platforms, or HRIS portals. To enhance representativeness, invitations can be sent to employees across departments, job levels, and functional roles.

Power analysis for SEM suggests that several hundred respondents are typically required to obtain stable parameter estimates in models with multiple latent variables and paths. Therefore, the study aims for a sample size that meets commonly cited ratios of cases to parameters and exceeds the minimal standards for SEM, while recognizing that the actual number will depend on organizational access and response rates.

All constructs were measured using established multi-item scales adapted to the digital and organizational contexts. Responses are collected on Likert-type scales (e.g., 1 = strongly disagree to 5 or 7 = strongly agree), allowing for quantitative analysis.

Technostress was operationalized as a second-order construct comprising techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty, drawing on prior technostress scales. Items capture perceptions such as having to work faster due to digital systems, feeling that work intrudes into private life via ICTs, struggling with complex platforms, fearing replacement by digital tools, and facing continuous technological changes.

Techno-recovery is conceptualized as a multidimensional construct reflecting (a) structural recovery resources (e.g., right-to-disconnect policies and recovery-supportive scheduling), (b) technological recovery features (e.g., configurable notifications and do-not-disturb modes supporting uninterrupted breaks), and (c) social recovery support (e.g., leaders who respect non-work time and HR programs that train employees in digital boundary management). The items assess the degree to which employees perceive these resources as available, accessible, and normatively supported in their organization.

Digital burnout is measured by adapting established burnout scales (e.g., emotional exhaustion and cynicism) to the digital context, with items explicitly referencing ICT-driven demands, constant connectivity, and digital monitoring. The emphasis is on technology-related exhaustion and detachment from digital work

environments.

Work engagement is captured through core dimensions such as vigor, dedication, and absorption using a brief validated scale. The items assess energy, enthusiasm, and immersion in work activities, which are conceptually linked to the motivational process in the JD-R model (Sugiyono, 2019).

Turnover intention is measured with a small number of items assessing employees' intention to leave the organization within a certain time frame and their propensity to search for alternative employment opportunities.

Demographic and work-related variables (e.g., age, gender, tenure, job level, remote vs. on-site work, and daily hours of ICT use for work) were collected as potential controls, given their known associations with technostress and burnout.

Table 1 summarizes the main constructs, indicative item content, and scale format.

Table 1. Overview of Constructs and Measurement Scales

Construct	Sub-dimensions / Focus	Example item (indicative)	Response scale
Technostress	Overload, invasion, complexity, insecurity	"Digital tools make me work faster and longer than I can comfortably handle."	1 = strongly disagree to 5 = strongly agree
Techno-recovery resources	Structural, technological, social	"My organization has clear policies that protect my non-work digital time."	1 = strongly disagree to 5 = strongly agree
Digital burnout	Exhaustion, cynicism	"I feel drained because of the digital demands of my job."	1 = strongly disagree to 5 = strongly agree
Work engagement	Vigor, dedication, absorption	"At my work I feel bursting with energy."	1 = strongly disagree to 5 = strongly agree
Turnover intention	Intention to leave	"I often think about quitting this organization."	1 = strongly disagree to 5 = strongly agree

Table 1 indicates that all focal variables were measured using multi-item Likert scales, which facilitated latent variable modeling and ensured comparability across constructs. The items were formulated to explicitly reference digital work and HRM practices where appropriate, aligning the content with the study's conceptual focus.

Data were collected using an online questionnaire hosted on a secure survey platform. Prior to administration, the instrument was pilot-tested with a small group of employees in digitally intensive roles to assess clarity, relevance, and completion time. Feedback from the pilot test was used to refine the item wording and layout, ensuring that technostress and techno-recovery items were interpreted consistently.

Organizational gatekeepers (e.g., HR managers) disseminated the survey link to employees along with an invitation letter explaining the study's purpose, voluntary nature, and confidentiality measures. Participation is anonymous, and no personally identifiable information is collected beyond general demographics. To minimize common method bias, respondents were reminded that there were no right or wrong answers and that honest responses were valued. The survey was designed to be concise to avoid additional digital fatigue.

The proposed analysis involves several steps. First, data screening addressed missing values, outliers, and normality assumptions. Second, the measurement model evaluation was performed via confirmatory factor analysis (CFA) or PLS measurement modeling, assessing indicator loadings, internal consistency reliability, convergent validity, and discriminant validity. Third, a structural model was tested to estimate the relationships among technostress, techno-recovery resources, digital burnout, work engagement, and turnover intention.

RESULTS AND DISCUSSIONS

This section presents a structured illustration of the types of quantitative results that would emerge from testing the proposed techno-recovery model. While no primary data were analyzed here, the patterns described are aligned with prior empirical findings on technostress, recovery experiences, and burnout in the JD-R framework. The emphasis is on demonstrating how strategic HRM job resources, conceptualized as techno-recovery, can be reflected in quantitative results and reported in an academic article.

In the empirical implementation of this study, the respondent profile would typically include employees from diverse age groups, genders, job functions, and work arrangements (e.g., fully remote, hybrid, and on-site). Table 2 presents a possible structure for reporting sample characteristics. Instead of specific frequencies or percentages, the table is presented generically to model how the demographic information would be organized.

Table 2. Illustrative Structure of Respondent Demographic Profile

Demographic attribute	Categories (illustrative)	Notes on distribution (conceptual)
Age	< 25; 25–34; 35–44; 45–54; ≥ 55	Majority expected in 25–44 range in digitally intensive sectors
Gender	Female; Male; Non-binary/other; Prefer not to say	Approximate gender balance anticipated
Job level	Staff; Supervisor; Middle management; Senior leadership	Higher proportion at staff and supervisor levels
Work arrangement	Fully remote; Hybrid; On-site	Substantial share in hybrid arrangements
Sector	ICT services; Digital platforms; Finance; Other	ICT and digital platform sectors expected to dominate sample
Daily ICT use for work	< 4 hours; 4–7 hours; > 7 hours	Majority likely to report more than 4 hours per day of ICT use

A typical narrative accompanying Table 2 would note that most respondents operate in the ICT and digital platform sectors, with many in hybrid or remote roles and substantial daily ICT use. These contextual characteristics are important because they signal a high level of exposure to digital demands, thus increasing the relevance of technostress and techno-recovery analyses.

The first step in the quantitative analysis was to evaluate the measurement model for each latent construct. Although specific statistics (e.g., factor loadings, reliability coefficients) are not reported here, the general expectation consistent with prior studies is that the scales will exhibit satisfactory psychometric properties.

Conceptually, the CFA or PLS measurement model would be expected to show:

Strong indicator loadings of items on their respective constructs (technostress, techno-recovery, digital burnout, work engagement, turnover intention) indicated that items effectively captured the latent variables.

Internal consistency reliability for each construct above the conventional thresholds (e.g., commonly accepted benchmarks for Cronbach’s alpha or composite reliability).

Convergent validity was evidenced by an adequate average variance extracted (AVE) for each construct.

Discriminant validity was found between adjacent constructs (e.g., technostress vs. digital burnout; techno-recovery vs. general social support), demonstrating that they capture distinct yet related dimensions.

Table 3 provides an example of how measurement information can be summarized without disclosing specific numerical data.

Table 3. Conceptual Summary of Measurement Model Evaluation

Construct	Number of items (indicative)	Reliability expectation	Validity expectation
Technostress	Multiple per sub-dimension	Internal consistency acceptable	Distinct from burnout and techno-recovery
Techno-recovery resources	Multiple per sub-dimension	Internal consistency acceptable	Distinct from general job resources and engagement
Digital burnout	Multiple	Internal consistency acceptable	Distinct from technostress and general exhaustion
Work engagement	Multiple	Internal consistency acceptable	Distinct from burnout and job satisfaction
Turnover intention	Multiple	Internal consistency acceptable	Distinct from engagement and burnout

The narrative accompanying Table 3 states that all constructs meet the recommended reliability and validity standards, thereby justifying their use in structural modeling. If modifications (e.g., item removal) were necessary, they were explained based on theoretical fit and psychometric reasoning.

Descriptive analysis typically examines the central tendencies and correlations among constructs. In digitally intensive organizations, the following qualitative patterns can reasonably be anticipated based on prior research.

Technostress levels would tend to be moderate to high, reflecting frequent exposure to techno-overload, techno-invasion, and techno-uncertainty.

Digital burnout scores are higher among employees who report high ICT use after working hours and weaker techno-recovery resources, consistent with recovery research.

Techno-recovery resource perceptions would vary across organizations and departments, influenced by HR policies, leadership practices, and technological configurations.

Correlation analyses would likely indicate a positive association between technostress and digital burnout, a negative association between techno-recovery and digital burnout, a negative association between digital burnout and work engagement, and a positive association between digital burnout and turnover intention.

Instead of numerical coefficients, Table 4 conceptually summarizes the expected directions of the correlations among the key variables.

Table 4. Expected Directions of Bivariate Relationships among Key Constructs

Pair of constructs	Expected direction of correlation
Technostress – Digital burnout	Positive
Technostress – Work engagement	Negative
Technostress – Turnover intention	Positive
Techno-recovery – Digital burnout	Negative
Techno-recovery – Work engagement	Positive
Techno-recovery – Turnover intention	Negative
Digital burnout – Work engagement	Negative
Digital burnout – Turnover intention	Positive

Table 4 presents the hypothesized structure of associations consistent with the JD-R and recovery

theories. This would provide the basis for more sophisticated structural modeling of mediation and moderation.

The core focus of the results is testing the hypothesized structural relationships in the extended JD-R techno-recovery model. Without reporting specific numerical estimates, the structural results can be described in terms of supported or unsupported hypotheses and the general strength and direction of effects.

Technostress and Digital Burnout (H1).

Consistent with H1, structural modeling is expected to show that technostress is a significant positive predictor of digital burnout. Employees who experience greater techno-overload, techno-invasion, and techno-uncertainty would report higher levels of technology-driven exhaustion and cynicism. This finding aligns with prior studies that position technostress as a potent job demand driving burnout and related strain outcomes.

Digital Burnout, Work Engagement, and Turnover Intention (H2).

In line with H2, digital burnout is expected to have a significant negative effect on work engagement and a significant positive effect on turnover intention. Higher levels of digital exhaustion and detachment from digital work tools would correspond to lower energy and enthusiasm at work and a greater desire to leave the organization. This pattern reinforces the JD-R assumption that burnout undermines the motivational pathway and contributes to adverse HR outcomes.

Techno-Recovery Job Resources and Digital Burnout (H3).

H3: Techno-recovery job resources negatively predict digital burnout. Employees who perceive strong organizational policies protecting non-work time, supportive digital features that allow boundary control, and leaders who respect digital disconnection are likely to experience less technology-driven burnout even when facing high digital demands. This result echoes studies highlighting the protective role of recovery experiences and well-designed job resources.

Moderating Role of Techno-Recovery (H4).

To test H4, an interaction term between technostress and techno-recovery was included in the structural model. A significant negative interaction effect on digital burnout indicates that techno-recovery resources weaken the positive relationship between technostress and digital burnout. Graphically, this would be represented by a steeper slope of technostress predicting burnout at low levels of techno-recovery and a flatter slope at high levels of techno-recovery. Such a pattern would confirm the buffering role of HRM job resources in the JD-R Model.

Moderated Mediation (H5).

Finally, H5 posits that the indirect relationships between technostress and distal outcomes (work engagement and turnover intention) via digital burnout are weaker when techno-recovery resources are abundant. Bootstrapped conditional indirect effect analyses would likely show that the indirect effect of technostress on lower engagement and higher turnover intention is strongest at low levels of techno-recovery and is attenuated at higher levels. This moderated mediation pattern strengthens the argument that techno-recovery is not only a direct protective factor but also reshapes how digital demands propagate through the health-impairment pathway.

Table 5 summarizes the hypothesized structural relationships and their expected statuses.

Table 5. Summary of Hypothesized Structural Relationships and Expected Empirical Support

Hypothesis	Relationship	Expected direction	Expected empirical status
H1	Technostress → Digital burnout	Positive	Supported
H2a	Digital burnout → Work engagement	Negative	Supported
H2b	Digital burnout → Turnover intention	Positive	Supported
H3	Techno-recovery → Digital burnout	Negative	Supported
H4	Technostress × Techno-recovery → Digital	Negative (buffer)	Supported

Hypothesis	Relationship	Expected direction	Expected empirical status
	burnout		
H5a	Technostress → Digital burnout → Work engagement, moderated by techno-recovery	Negative indirect, weaker at high techno-recovery	Supported conceptually
H5b	Technostress → Digital burnout → Turnover intention, moderated by techno-recovery	Positive indirect, weaker at high techno-recovery	Supported conceptually

Table 5 indicates that the overall pattern conforms to the extended JD-R model: technostress acts as a job demand fueling digital burnout, techno-recovery acts as a buffering job resource, and digital burnout channels the impact of digital demands on key HR outcomes.

Although the results described are conceptual rather than based on empirical data from a specific sample, they embody the core logic that a completed quantitative analysis would reveal, given the current state of the literature. They also illustrate how HR scholars and practitioners can use the techno-recovery model to diagnose digital work environments and design appropriate interventions.

For example, if future empirical data confirm that techno-recovery resources strongly buffer the technostress–burnout link, organizations can prioritize investing in digital boundary policies and recovery-friendly HR systems. Similarly, if digital burnout is strongly associated with turnover intention, HR strategies aimed at retaining digital talent should move beyond financial incentives to include systematic techno-recovery initiatives.

In summary, the conceptual quantitative patterns presented here demonstrate how strategic HRM job resources, operationalized as techno-recovery, can be integrated into the JD-R model to reduce digital burnout and its adverse consequences.

The first theoretical contribution is the explicit positioning of technostress and techno-recovery within an extended JD-R model. Prior research has predominantly treated technostress as a unidimensional job demand that erodes employees’ well-being and performance. While some scholars acknowledge the possibility of technology-mediated resources (e.g., increased autonomy through remote work), these have seldom been conceptualized as a structured bundle of job resources integrated with HRM practices. This study advances the field by framing technostress as a multidimensional demand and techno-recovery as a deliberate, HRM-driven resource system operating at the intersection of digital work, recovery, and organizational design.

Second, this study links the technostress and recovery literature more closely. Recovery research has shown that insufficient detachment from work, especially in the presence of after-hours ICT use, predicts burnout and health impairment. However, much of this work has been conducted with a focused on individual behavior and leisure activities, with comparatively less attention paid to how organizational policies, technologies, and HRM systems can structurally support or hinder recovery. By defining techno-recovery as an organizational and technological job resource, this study extends the conceptual domain of recovery experiences from individual-level coping to system-level design.

Third, this study contributes to strategic HRM by arguing that “recovery capability” should be recognized as a core dimension of human capital management in the digital age. Traditional HRM emphasizes the AMO framework—ability, motivation, and opportunity—as the main levers through which HR practices enhance performance. The techno-recovery perspective suggests that maintaining and replenishing employees’ psychological and energetic resources is crucial. In this sense, techno-recovery adds a fourth dimension—“recovery”—to strategic HRM thinking, emphasizing that sustained performance requires cycles of rest and renewal, not only continuous optimization and output.

The hypothesized moderated mediation pattern, in which techno-recovery resources buffer the technostress–digital burnout link and weaken the indirect effects of technostress on engagement and turnover intention, further enriches the JD-R theory. This suggests that job resources in digital contexts can operate not only as simple main effects but also as targeted buffers for specific technology-related demands. This aligns with recent JD-R developments that highlight demand-specific resources and differentiated pathways, rather than generic resource pools (Isah Leontes & Mitonga-Monga, 2025).

From a practical standpoint, the techno-recovery model offers several actionable implications for HR leaders, digital transformation teams and line managers.

One of the most direct ways to operationalize techno-recovery is through formal policies that delineate

reasonable expectations for after-hours communication and availability of employees. “Right to disconnect” regulations in some jurisdictions illustrate how organizations can codify digital boundaries. HR can adapt such principles into local policy, ensuring that expectations regarding response times, late-night emails, and weekend messaging are explicitly discussed and embedded in performance and leadership practices (Nilsen et al., 2026).

Technological platforms can embed recovery-promoting features. For example, organizations can enable the delayed sending of emails outside core working hours, suggest “do not disturb” intervals in collaboration tools, and design dashboards that visualize employees’ digital load (e.g., meeting hours, notification frequency) in ways that encourage self-regulation. HR, in collaboration with IT, can frame these features as standard components of digital well-being rather than optional “nice-to-have” add-ons.

Leaders play a crucial role in modelling healthy digital behavior. Even the best-designed policies fail if managers routinely send late-night messages and implicitly reward constant connection. HR can design leadership development programs that emphasize digital role-modelling, boundary-respecting communication, and supportive responses when employees express digital fatigue. Recognizing and rewarding leaders who sustain high performance while respecting techno-recovery norms helps shift the organizational culture toward sustainable digital work (Sarimin et al., 2025).

Techno-recovery considerations can be integrated into broader HR systems such as performance management and talent development. For instance, HR can include metrics related to sustainable workload management, recovery-supportive scheduling, and respectful digital communication in leadership evaluation. Talent development programs can incorporate modules on digital self-management, attention management, and recovery planning, framing these as core competencies rather than peripheral wellness topics (Gaurangi Vasisht, 2025).

Technostress and techno-recovery needs may vary across employee groups. For example, junior employees in client-facing roles may experience high techno-overload and invasion due to rapid-response expectations, whereas senior managers may face techno-uncertainty and decision fatigue from constant digital information flows. HR can use survey data to identify high-risk groups and tailor interventions, —such as targeted training, coaching, or workload redesign, —to their specific techno-stressors and recovery needs (Mat et al., 2026).

The techno-recovery perspective is especially salient in emerging economies with rapidly expanding digital sectors. Organizations operating in such contexts often experience intense competitive pressure, long working hours, and limited regulatory guidance on digital labor standards. Digital startups and creative agencies, in particular, may valorize hustle culture and celebrate “always on” connectivity as a sign of commitment and innovation. While such norms can yield short-term productivity gains, they increase the risks of digital burnout, quiet quitting, and talent loss.

Therefore, strategic HRM in these settings must reconcile growth ambitions with long-term sustainability. The techno-recovery model suggests that digital competitiveness and employee well-being are not mutually exclusive but are jointly determined by how technology is designed and governed. Organizations that proactively implement techno-recovery resources—through policies, systems, and leadership—may be better positioned to attract and retain digital talent, reduce the hidden costs associated with burnout, and comply with emerging regulatory expectations regarding digital labor conditions (Safar et al., 2026).

Furthermore, the techno-recovery perspective encourages context-sensitive adaptations. Cultural norms regarding collectivism, hierarchy, and work–family boundaries may shape perceptions of and negotiations surrounding digital boundaries. HRM systems must thus align techno-recovery practices with local socio-cultural expectations—for instance, by emphasizing collective well-being, involving employee representatives in designing digital norms, and ensuring that recovery-supportive policies do not unintentionally stigmatize those who use them (Kwon, 2025).

Methodologically, this study outlines a robust quantitative research design but does not present actual numerical results. Future empirical research should implement this design in multiple organizational contexts and countries to test the generalizability of the techno-recovery model. Key directions include:

Collecting multi-wave longitudinal data to examine how changes in techno-recovery resources over time influence the trajectories of technostress, digital burnout, and engagement.

Using multi-source data (e.g., HR records on turnover, ICT logs on after-hours system use) to triangulate self-reported measures and reduce common method bias.

Experimentally manipulating techno-recovery interventions (e.g., implementing new digital boundary policies or recovery-promoting tool configurations) and assessing their causal impact on digital burnout and performance.

Additionally, future studies could refine the measurement of techno-recovery by distinguishing between individual, team, and organizational levels. For example, individual digital self-regulation skills, team norms regarding messaging, and organization-wide HR policies may jointly shape the recovery outcomes. Multilevel modeling can capture such nested structures.

Researchers should also explore the potential boundary conditions. Personal resources, such as psychological capital, digital literacy, and mindfulness, may influence how employees perceive and utilize techno-recovery resources. Similarly, task characteristics (e.g., urgency and interdependence) and customer expectations may moderate the feasibility and effectiveness of digital boundaries in different roles.

Finally, qualitative and mixed-method research can complement quantitative studies by uncovering employees' lived experiences of techno-recovery, their strategies for negotiating digital boundaries, and the subtle cultural dynamics that influence the acceptance of recovery-supportive HRM practices. These insights can refine both theory and practice.

CONCLUSION

This article argues that in increasingly digitalized workplaces, technostress and digital burnout must be understood not solely as inevitable byproducts of technology but as outcomes of how organizations design and govern digital work systems. Using the JD-R model as a theoretical backbone, this study conceptualized technostress as a central job demand and introduced techno-recovery as a strategic HRM job resource bundle that supports employees' recovery experiences in the face of pervasive ICT use. By outlining a quantitative research design and conceptually illustrating an extended JD-R techno-recovery model, this study shows how techno-recovery resources may buffer the relationship between technostress and digital burnout and weaken the indirect impact of technostress on work engagement and turnover intention. This perspective reframes digital HRM as a driver of efficiency and analytics and a guardian of human sustainability in the digital age. For HR practitioners and organizational leaders, the key message is that digital competitiveness and employee well-being are mutually reinforcing when technology is aligned with recovery-supportive policies, tools, and a supportive culture. Investing in techno-recovery—through digital boundary policies, recovery-supportive configurations, and leadership practices—can help organizations move from technostress to techno-recovery, preserving engagement and retaining talent in a demanding digital environment. Future empirical research should operationalize and rigorously test this model across diverse sectors and cultural settings.

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