

Digital Work Overload Management Practices and Employee Well-Being: A Time-Lagged Sequential Mediation and Moderation Model

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ABSTRACT

Aim of the Study: Drawing on Job Demands–Resources (JD-R) and Conservation of Resources (COR) theories, this study examines whether digital work overload management practices (DWOMP) enhance employee well-being through the sequential mediation of perceived workload management, psychological detachment, and work–life balance, and whether digital mindfulness and managerial empathy act as boundary conditions.

Methodology: A time-lagged two-wave survey design with a four-week interval was used. Full-time employees of digitally intensive organizations in Lahore, Pakistan, were selected through purposive sampling, yielding 385 matched responses. DWOMP was modelled as a reflective–reflective higher-order construct, and the hypotheses were tested with partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4.0 using bootstrapping.

Findings: DWOMP positively predicted perceived workload management ($\beta = .526$), psychological detachment ($\beta = .255$), and work–life balance ($\beta = .126$). Perceived workload management, psychological detachment, and work–life balance sequentially mediated the effect of DWOMP on employee well-being ($\beta = .039$, $p < .001$), and the model explained 68.9% of the variance in well-being. Managerial empathy strengthened the relationship between psychological detachment and work–life balance ($\beta = .069$, $p = .024$) but did not moderate the balance–well-being link, while digital mindfulness did not moderate any of the examined paths.

Conclusion: DWOMP operate as organizational resources that initiate a resource-gain sequence from workload appraisal to recovery, balance, and well-being. Empathic supervision matters mainly at the transition from recovery to balance.

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Organizations should combine structural workload practices with supportive supervision, thereby advancing Sustainable Development Goals 3 (Good Health and Well-Being) and 8 (Decent Work and Economic Growth).

Keywords: Digital work overload management practices; Psychological wellbeing; Psychological detachment; Work–life balance; Managerial empathy; Digital mindfulness; SDG 3 and SDG 8; Safe working environment.

1. INTRODUCTION

The fast proliferation of digital technologies has significantly changed the organization and coordination of work, offering unique opportunities for flexibility and connectedness and creating digital stress at the same time. Modern organizations need constantly available collaborative platforms, mobile devices, and advanced AI systems to maintain high efficiency. However, the co-existence of these two creates demands that go beyond employees' cognitive and temporal resources (Han et al., 2025; Pasha et al., 2025). The paradox of digital technologies serving simultaneously as organizational enablers and disruptors (Tarafdar et al., 2019) has made digital work overload the focal point of modern management research and organizational concern. Recent evidence from human–AI work systems likewise shows that advanced digital tools do not automatically benefit employees; their effects depend on how employees calibrate and regulate their engagement with the technology (Adeel et al., 2026).

Digital work overload implies the perception of technological work demands exceeding the cognitive, temporal, and psychological resources of employees. According to the Job Demands-Resources (JD-R) theory, such demands are supposed to result in the depletion of employees' resources, the disruption of the recovery process, the disruption of work-life balance, and decreased well-being unless compensated by organizational resources (Adeel & Batool, 2026; Bakker et al., 2004; Demerouti et al., 2001; Edeh et al., 2025). Considerable evidence has shown that these dynamics take place in the case of the digital work environment as well: digitization of the workplace impacts the well-being of employees through the digital work demands and anxiety (Han et al., 2025); digital fatigue and cognitive overload can be considered among the important managerial challenges that are able to be managed through proper workload management strategies (Pasha et al., 2025). Thus, these studies suggest that digital work overload is not an inevitable phenomenon and does not depend only on individuals but is an issue that can be managed by organizations.

However, there are several weaknesses in the existing literature. First, research pays more attention to the negative effects of digital work overload than to organizational interventions addressing this problem. While there are numerous studies on the antecedents of digital work overload – technostress generators, work intensification, and digital fatigue – not enough attention is paid to the organizational practices aimed at addressing these demands (Ragu-Nathan et al., 2008; Tarafdar et al., 2019). Emerging mechanisms such as workload monitoring, workload redistribution, technological assistance, digital boundary support, and the right to disconnect may reflect organizational practices aimed at addressing the demands of the technology (Barber & Santuzzi, 2015; Kossek et al., 2012). Recent research on hybrid work suggests that technostress and lack of psychological detachment lead to burnout and questions which organizational supports can buffer these effects, thus signalling a need for the empirical evaluation of these practices' effectiveness (Whelan et al., 2026). This weakness is at the centre of an ongoing academic debate. One stream of research locates responsibility for digital overload with individuals and emphasizes self-regulatory capacities such as mindful technology use (Marsh et al., 2024, 2026; She et al., 2021), whereas another stream argues that overload is a structural job-design problem requiring organizational and even regulatory responses, such as right-to-disconnect policies (Alkandari et al., 2025; Hopkins, 2024; Lamovšek et al., 2026). Scoping evidence also indicates that, although a growing number of jurisdictions and employers have introduced right-to-disconnect provisions, evidence on how such practices translate into employee outcomes remains limited (Hopkins, 2024). Empirical studies that

evaluate organizational practices and individual resources within the same model are therefore needed to inform this debate.

Another weakness of the current research lies in the application of direct-effect models implying immediate positive results of the organizational practices without any consideration of intermediary psychological processes. However, contemporary theories of organizational behavior suggest that the practices influence the outcomes through the sequence of psychological and affective processes (Bakker & Demerouti, 2017; Hobfoll et al., 2018). Integrating JD-R and COR theory (Demerouti et al., 2001; Hobfoll, 1989), the current research suggests treating the digital work overload management practices as organizational resources influencing perceived workload management and, in turn, increasing psychological detachment, work-life balance, and well-being directly and through the proposed sequence of processes. Psychological detachment means employees' ability to mentally switch off from work outside regular working hours and has been found to facilitate recovery and well-being (Baktash & Pütz, 2025; Blake et al., 2025). Work-life balance is also expected to be influenced by the interaction between digital work demands and resources rather than by digital technologies alone (Lamovšek et al., 2026).

Apart from these sequential relations, there might be certain individual and contextual factors moderating employees' reactions to digital workload management practices and making the proposed model applicable in practice. Prior research has shown that both contextual conditions, such as a caring organizational climate, and individual differences, such as Type A/B behavioural patterns, shape how employees experience and respond to work stressors (Afzal et al., 2021; Jin et al., 2022). The recently validated concept of digital mindfulness – conscious non-judgmental attitude to the technology use – can facilitate self-regulation (Marsh et al., 2026). Evidence from workplace samples shows that more mindful employees are better protected against the adverse effects of digital working, such as overload and technostress (Marsh et al., 2024), and integrative reviews suggest that mindfulness shapes how employees appraise and respond to work demands (Good et al., 2016). Another such factor can be managerial empathy – managers' ability to understand and respond to the emotions and needs of the followers (Kock et al., 2019). The recently published systematic review of the literature on this topic suggests the relevance of this boundary condition under the conditions of digitization and emotional intensity (Muss et al., 2026), and meta-analytic evidence shows that supervisor support that is specific to employees' non-work demands is more strongly related to lower work–family conflict than general support (Kossek et al., 2011). As a result, the well-being of the employees may be considered as the distal outcome of the proposed model, which is consistent with the JD-R and COR theories suggesting that maintaining the psychological state of the employees through organizational resources is the main task of these theories (Demerouti et al., 2001; Hobfoll, 1989).

In summary, these developments show that the digital work overload management needs to be analyzed as an integrated system working through a certain sequence of psychological processes and moderated by the individual and managerial boundary conditions rather than a set of practices. The proposed research addresses this gap by suggesting and testing the extended sequential mediation model with two moderators. Digital work overload management practices are expected to influence perceived workload management, which, in its turn, will positively affect psychological detachment, work-life balance, and the overall well-being of the employees. In order to make stronger inferences about the sequential psychological mechanisms, this study uses a time-lagged two-wave (T1-T2) design rather than the cross-sectional one.

1.1 Problem Statement, Research Objectives, and Significance of the Study

Although organizations increasingly adopt practices intended to contain digital work overload, it remains unclear whether, how, and for whom such practices improve employee well-being. Recent studies have documented the costs of digitization, technostress, and extended availability for employee recovery and well-being (Dettmers, 2017; Han et al., 2025; Whelan et al., 2026), and others have shown that workload management can buffer the performance costs of digital fatigue (Pasha et al., 2025). However, these

studies examine either the harmful demands or single, isolated resources, and they rarely specify the sequence of psychological processes linking organizational practices to well-being or the conditions under which these processes are strengthened. The problem addressed by this study is therefore the lack of an integrated, theory-driven explanation of the mechanisms and boundary conditions through which a bundle of digital work overload management practices influences employee well-being.

Accordingly, the study pursues four research objectives: (RO1) to examine the effects of DWOMP on perceived workload management, psychological detachment, and work–life balance; (RO2) to examine the relationships among perceived workload management, psychological detachment, work–life balance, and employee well-being; (RO3) to test whether perceived workload management, psychological detachment, and work–life balance sequentially mediate the relationship between DWOMP and employee well-being; and (RO4) to examine whether digital mindfulness and managerial empathy moderate the sequential pathways.

This study makes two theoretical contributions. First, it advances the technostress and JD-R/COR literatures by elaborating the cognitive and affective mechanisms of the effect of organizational practices on the distal employee outcomes, providing useful knowledge for the ongoing research on hybrid work and digital demands processing (Whelan et al., 2026). Second, it offers practical recommendations for the design of digital workload intervention programs, especially taking into account the recent evidence on the beneficial effect of the structured workload management on performance in the conditions of digital fatigue (Pasha et al., 2025). Because a growing number of jurisdictions and employers have introduced right-to-disconnect and related provisions (Hopkins, 2024), and because the productivity and well-being costs of unmanaged digital demands are increasingly documented (Han et al., 2025; Pasha et al., 2025), a proper understanding of the actual effect of these practices and the related psychological mechanisms is relevant both theoretically and practically. Finally, the study is directly relevant to the United Nations 2030 Agenda for Sustainable Development (United Nations, 2015). By identifying organizational practices that protect employee well-being in digitally intensive workplaces, it contributes to Sustainable Development Goal (SDG) 3, Good Health and Well-Being, particularly target 3.4 on promoting mental health and well-being. By showing how organizations can contain digital overload, protect off-job time, and support work–life balance, it also contributes to SDG 8, Decent Work and Economic Growth, particularly target 8.8 on promoting safe and secure working environments for all workers.

2. LITERATURE REVIEW

The following section presents the theoretical bases and the focal constructs that form the grounds of the hypotheses discussed in Section 3 of the paper and draw on the Job Demands-Resources (JD-R) model and Conservation of Resources (COR) theory.

2.1 Job Demands-Resources and Conservation of Resources Theory

Job Demands-Resources (JD-R) theory postulates that any profession includes risk factors for job stress, which can be classified into two main categories, namely job demands and job resources (Demerouti et al., 2001). Excessive job demands exceeding an individual's capacity to cope with them lead to resource depletion and decreased well-being; however, job resources including organizational practices helping employees to cope with those demands mitigate the depletion and foster motivation and recovery (Bakker et al., 2004; Bakker & Demerouti, 2017). In turn, the main tenet of COR theory states that people seek to acquire, preserve, and protect resources they value, and losses and gains of resources recur in spirals: initial gains trigger further gains, while losses precede further losses (Hobfoll, 1989; Hobfoll et al., 2018). Taken together, COR and JD-R theories provide a framework for the key hypothesis of the study, which posits that organizational practices aimed at managing digital work overload serve as resources that initiate the process of accumulating further psychological resources culminating in employee well-being.

2.2 Digital Work Overload Management Practices

Digital work overload management practices (DWOMP) are organizational resources that help employees cope with demands of technology exceeding their cognitive, time, and psychological capacity (Han et al., 2025; Pasha et al., 2025). They can be understood as a specific bundle of human resource management practices; prior research has shown that HRM practices that enhance employees' ability, motivation, and opportunity bolster employee well-being (Jamil et al., 2025). In the current study, DWOMP is conceptualized as a reflective-reflective second-order construct consisting of five first-order practices, such as workload monitoring (early identification of excessive demands) (Karasek et al., 1998), workload redistribution (prevention of workload distribution inequality among teams) (Bakker et al., 2004; Karasek et al., 1998), technological assistance (increasing efficiency of tasks) (Ragu-Nathan et al., 2008; Tarafdar et al., 2019), digital boundary support (separation of work and personal life) (Kossek et al., 2012), and right to disconnect (protection of employees from work-related contacts outside working hours) (Barber & Santuzzi, 2015; Hopkins, 2024).

2.3 Perceived Workload Management

Perceived workload management implies employees' perception of whether their workload is reasonable and manageable. According to COR theory, a manageable workload does not significantly deplete the resources of the employees and contributes to resource restoration (Hobfoll, 1989), while according to JD-R theory it decreases stress and enables more efficient recovery (Demerouti et al., 2001).

2.4 Psychological Detachment

Psychological detachment involves the capacity of the employees to mentally detach from work when they are not at work. It is a proven mechanism of recovery, which helps to protect well-being (Blake et al., 2025; Sonnentag, 2012; Wendsche & Lohmann-Haislah, 2017). Connectivity via smartphones, email, and collaboration tools usually leads to blurring of the line between work and private life, thus preventing detachment (Barber & Santuzzi, 2015; Dettmers, 2017).

2.5 Work-Life Balance

Work-life balance involves the ability of the employees to cope with professional and personal life role demands. Within the JD-R theory, adequate organizational resources help integrate work and personal life (Demerouti et al., 2001); according to COR theory, having enough resources allows an individual to conserve energy and achieve balance (Hobfoll, 1989). Recent research demonstrates that digital context makes work-life balance dependent on the combination of job demands and resources rather than on technology usage alone (Lamovšek et al., 2026).

2.6 Employee Well-Being

Employee well-being is also a global development priority: the 2030 Agenda explicitly commits to promoting mental health and well-being (SDG 3) and decent work for all (SDG 8) (United Nations, 2015). Employee well-being is considered the distal outcome of the proposed model and, similarly to JD-R and COR theories, it is seen as the result of continuous psychological resource accumulation rather than the immediate effect of organizational practices (Demerouti et al., 2001; Hobfoll, 1989). Conceptually, this study follows Zheng et al. (2015), who define employee well-being as a multidimensional state comprising three related components: life well-being (employees' satisfaction with their life as a whole), workplace well-being (satisfaction and positive affect associated with work), and psychological well-being (positive self-evaluation, personal growth, and a sense of purpose). This conceptualization integrates hedonic (satisfaction and affect) and eudaimonic (functioning and growth) traditions and captures well-being in both the work and non-work domains. It is particularly suitable for the present model because the resources examined here operate across domains: perceived workload management and psychological detachment originate in the work domain, whereas work-life balance links work to non-work life. A context-free or work-only indicator would therefore not capture the full range of

outcomes implied by a cross-domain resource-gain process. The same multidimensional conceptualization has recently been applied to the study of digitized workplaces (Han et al., 2025), and research shows that work–life balance and detachment relate to both work-related and general indicators of well-being (Baktash & Pütz, 2025; Haar et al., 2014).

2.7 Digital Mindfulness

Digital mindfulness means conscious and non-judgmental attention to digital interactions. It was conceptualized and validated as a work-related construct that affects the way cognitive appraisals and recovery experiences translate into well-being (Marsh et al., 2026). The construct extends the general notion of trait mindfulness, defined as receptive attention to and awareness of present events and experiences (Brown & Ryan, 2003), to the specific domain of technology use. Unlike general mindfulness, digital mindfulness refers to how employees engage with devices and applications while using them. Marsh et al. (2026) describe three facets: intention (having a clear purpose when turning to technology), attention (staying focused and resisting digital distraction), and attitude (responding to digital frustrations with kindness and without self-criticism). Digital mindfulness is also distinct from IT mindfulness, which concerns the alert and flexible use of a particular information system rather than the self-regulation of one's overall digital engagement (Marsh et al., 2026). The emphasis on regulating one's own engagement with technology parallels recent findings that metacognitive calibration determines whether employees benefit from AI tools at work (Adeel et al., 2026). From a JD-R and COR perspective, digital mindfulness can be understood as a personal resource: it may reduce the extent to which digital demands deplete attention and may help employees convert available resources into recovery. Consistent with this view, workplace research shows that mindfulness is associated with lower digital stress and overload (Marsh et al., 2024) and with more adaptive responses to work demands (Good et al., 2016).

2.8 Managerial Empathy

Managerial empathy refers to the capacity of the leader to perceive, understand, and respond to the needs of his/her followers. Research shows that it influences how organizational and psychological resources translate into followers' well-being outcomes (Kock et al., 2019); systematic research conducted recently shows its particular importance in digital work settings (Muss et al., 2026).

3. HYPOTHESES DEVELOPMENT

In the following section, the research hypotheses are developed sequentially based on the combination of JD-R and COR theories. This approach is consistent with current trends in digital work that involve moving from studying direct effects to process-oriented approaches (Han et al., 2025; Whelan et al., 2026). The research framework starts with organizational practices and ends up with well-being, including moderation effects afterwards. Each hypothesis is grounded in theory and supported by empirical evidence, with an emphasis on recent studies.

3.1 Digital Work Overload Management Practices and Perceived Workload Management

Employees experience growing amounts of excessive communication, information overload, and the necessity of constant connectivity that exceeds cognitive and emotional capacity of people (Han et al., 2025; Pasha et al., 2025). As organizational resources within JD-R theory, DWOMP help employees cope with these demands (Demerouti et al., 2001). Consistent with the COR theory, DWOMP help preserve and protect employees' resource reserves, thus mitigating the losses caused by continuous overload (Hobfoll, 1989). Workload monitoring helps detect excessive demands early; workload redistribution helps to avoid the unequal distribution of tasks among teams (Karasek et al., 1998). Technological assistance increases task efficiency (Ragu-Nathan et al., 2008). Digital boundary support and the right to disconnect protect employees from intrusions into their private time (Barber & Santuzzi, 2015; Kossek et al., 2012). Recent research demonstrates the utility of structured workload management in diminishing negative effects of digital fatigue and cognitive overload on performance (Pasha et al., 2025). As a result, DWOMP are expected to increase employees' perceived capacity to manage their workload.

H1: Digital work overload management practices positively influence perceived workload management.

3.2 Digital Work Overload Management Practices and Psychological Detachment

Based on resource-based reasoning, practices for managing digital overload are expected to affect recovery because the increased accessibility of work extends it beyond working hours (Barber & Santuzzi, 2015). According to JD-R theory, high job demands impede recovery, while organizational resources facilitate it; in addition, according to the COR theory, resource replenishment is needed to overcome depletion caused by digital work context (Hobfoll, 1989). Hybrid work literature indicates that technostress hampers psychological detachment, which in turn leads to burnout (Whelan et al., 2026), and longitudinal evidence shows that expectations of extended availability reduce detachment (Dettmers, 2017). The right to disconnect policies help reduce the expectations about continuous availability; workload balancing and technological assistance reduce unnecessary demands; digital boundary support helps to separate work and private life and promote recovery.

H2: Digital work overload management practices positively influence psychological detachment.

3.3 Digital Work Overload Management Practices and Work-Life Balance

Work-life balance implies managing demands from professional and personal life roles. According to JD-R theory, organizational resources help to cope with demands and contribute to work-life integration (Demerouti et al., 2001), and according to the COR theory, having enough resources enables energy conservation and balance (Hobfoll, 1989). Recent research shows that digital work context makes the work-life balance dependent on the joint effect of job design and demands and resources from ICTs, while unaddressed techno-overload causes imbalance regardless of other factors (Lamovšek et al., 2026). Similarly, after-hours communication demands have been linked to burnout and lower well-being, which has fuelled calls for right-to-disconnect policies (Alkandari et al., 2025).

H3: Digital work overload management practices positively influence work-life balance.

3.4 Perceived Workload Management and Psychological Detachment

Organizational practices may affect well-being indirectly, mediated by employees' perceptions. Perceived workload manageability involves the judgments of workload reasonableness and manageability. According to COR theory, manageable workloads do not cause excessive resource depletion and restore the resources (Hobfoll, 1989), while according to JD-R theory, manageable workloads reduce stress and enable recovery (Demerouti et al., 2001). Moreover, perceived control over workload reduces work-related rumination and promotes psychological recovery (Baktash & Pütz, 2025; Wendsche & Lohmann-Haislah, 2017). Recent research related to hybrid work shows that controllable digital workloads help to detach from work and prevent the development of burnout (Whelan et al., 2026).

H4: Perceived workload management positively influences psychological detachment.

3.5 Perceived Workload Management and Work-Life Balance

Perceived workload management is expected to affect work-life balance directly and indirectly via recovery. According to JD-R theory, manageable demands help to reduce the role conflict and improve work experiences (Demerouti et al., 2001), while the COR theory states that resource adequacy helps to achieve balance in different life spheres (Hobfoll, 1989). Configurational research suggests that the positive effect of manageable demands from work and ICTs on work-life balance depends on the joint management of demands and resources (Lamovšek et al., 2026).

H5: Perceived workload management positively influences work-life balance.

3.6 Perceived Workload Management and Employee Well-Being

Apart from indirect effects through recovery and work-life balance, perceived workload management is expected to have a direct effect on well-being. In terms of COR theory, people who perceive their

workload as manageable do not expect to lose resources, and it directly protects their psychological well-being, not only via recovery (Hobfoll, 1989). Current research on digitally-oriented work contexts suggests that the effect of workload appraisal on well-being is direct and goes beyond recovery effects, which means that manageable workloads may lead to better well-being regardless of recovery and detachment (Han et al., 2025; Whelan et al., 2026).

H6: Perceived workload management positively influences employee well-being.

3.7 Psychological Detachment and Work-Life Balance

According to research literature, recovery and work-life balance are interrelated rather than independent phenomena. The COR theory emphasizes the need for recharging resources to ensure functioning and prevent the depletion spiral (Hobfoll, 1989). People who succeed in detaching themselves from work during free time have better resource recharge, which leads to lower work-family conflict and better work-life balance (Dettmers, 2017). Recent prospective cohort studies show that psychological detachment is a reliable predictor of long-term well-being and life satisfaction and can be used as a predictor of sustainable work-life balance (Baktash & Pütz, 2025; Blake et al., 2025).

H7: Psychological detachment positively influences work-life balance.

3.8 Psychological Detachment and Employee Well-Being

Psychological detachment is expected to affect well-being directly. According to COR theory, resource restoration prevents exhaustion and maintains positive functioning (Hobfoll, 1989). There is a growing amount of longitudinal research that links psychological detachment to decreased stress and burnout and increased positive affect and well-being, especially during periods of high work-related stress (Blake et al., 2025; Wendsche & Lohmann-Haislah, 2017). Similarly, recent studies considering detachment as a driver of workplace happiness show the relationship between psychological detachment and increased well-being (Baktash & Pütz, 2025).

H8: Psychological detachment positively influences employee well-being.

3.9 Work-Life Balance and Employee Well-Being

Work-life balance directly affects the well-being of the employees. According to the COR theory, work-life balance helps to conserve resources in both working and non-working spheres (Hobfoll, 1989). Cross-cultural evidence shows that work-life balance is positively related to job satisfaction, life satisfaction, and mental health (Haar et al., 2014), and recent research related to digital context shows that well-being of the employees is determined by the interaction of demands and resources for work-life balance, and poor management of digital demands negatively affects well-being regardless of other resources (Han et al., 2025; Lamovšek et al., 2026).

H9: Work-life balance positively influences employee well-being.

3.10 Sequential Mediation

Based on Hypotheses 1 through 9, it is hypothesized that perceived workload management, psychological detachment, and work-life balance serve as successive mediators through which the effect of digital work overload management practices on well-being occurs. It is consistent with the JD-R and COR theories which emphasize the spiraling accumulation of resources, whereby organizational resources help to accumulate subsequent psychological resources leading to well-being (Demerouti et al., 2001; Hobfoll et al., 2018). It is also consistent with prior research showing that recovery experiences mediate the effects of job demands and resources on well-being (Kinnunen et al., 2011) and with recent research indicating that digital workplace interventions have predominantly indirect effects on well-being (Han et al., 2025; Whelan et al., 2026).

H10: Perceived workload management, psychological detachment, and work-life balance sequentially mediate the relationship between digital work overload management practices and employee well-being.

3.11 The Moderating Role of Digital Mindfulness

Differences between employees in the relation to technology are likely to affect the intensity of the processes above. Digital mindfulness is the conscious and non-judgmental attention to one's own digital interactions and it was conceptualized and validated as a work-related construct influencing the way cognitive appraisals and recovery experiences affect well-being (Marsh et al., 2026). In terms of COR theory, digital mindfulness can be regarded as the individual resource determining how well other resources (e.g., perceived workload control or psychological detachment) are used for psychological benefit (Hobfoll, 1989). Empirical research supports this reasoning. Mindfulness enhances the regulation of attention and emotion, which enables individuals to disengage from ruminative thinking and to benefit more from the resources available to them (Brown & Ryan, 2003; Good et al., 2016). In digital work settings, employees with higher mindfulness were better protected against stress, overload, and anxiety associated with digital working (Marsh et al., 2024), and digital mindfulness has been associated with lower technostress and exhaustion over time (Marsh et al., 2026). Research in Pakistani organizations has similarly shown that individual differences, such as Type A/B personality, moderate the relationship between organizational conditions and job stress (Afzal et al., 2021), and that employees' calibrated self-regulation of technology use conditions the outcomes of digital tools (Adeel et al., 2026). Employees who approach technology with intention and focused attention should therefore be better able to use a manageable workload as an opportunity to switch off after work, and to turn both workload manageability and detachment into positive well-being. Thus, employees with high levels of digital mindfulness will be able to transform perceived workload management into recovery and recovery into well-being better than employees with low levels of digital mindfulness.

H11: Digital mindfulness moderates the relationship between perceived workload management and psychological detachment, with the effect becoming stronger at higher levels of digital mindfulness.

H12: Digital mindfulness moderates the relationship between perceived workload management and employee well-being, with the effect becoming stronger at higher levels of digital mindfulness.

H13: Digital mindfulness moderates the relationship between psychological detachment and employee well-being, with the effect becoming stronger at higher levels of digital mindfulness.

3.12 The Moderating Role of Managerial Empathy

Apart from individual resources, resources provided by supervisors are expected to moderate the effect of recovery and work-life balance on well-being. Empathic leadership is the ability of the leader to perceive, understand, and respond to the followers' emotional and practical needs (Kock et al., 2019) and it has already been shown to have an important effect on the translation of organizational and psychological resources into followers' outcomes (Kock et al., 2019). Recent systematic research confirms the importance of the role of empathic leadership as the boundary condition of the process, particularly in demanding and digital work settings (Muss et al., 2026). Leadership has also been shown to shape employee outcomes through mediated and moderated mechanisms (Butt et al., 2025), and a caring organizational climate has been found to protect employees against social stressors and their psychological consequences (Jin et al., 2022). This reasoning is further supported by the work-family literature. Family-supportive supervisor behaviours, which include emotional support and creative work-family management, are associated with better work-family outcomes (Hammer et al., 2009), and meta-analytic evidence shows that supervisor support focused on employees' non-work needs is more strongly related to lower work-family conflict than general supervisor support (Kossek et al., 2011). In terms of the COR theory, an empathic leader can be considered an external resource enhancing the value of the internal resources (recovery experiences of the employees); employees who detach themselves from work but face an unsupportive supervisor fail to translate it into work-life balance, while the empathic

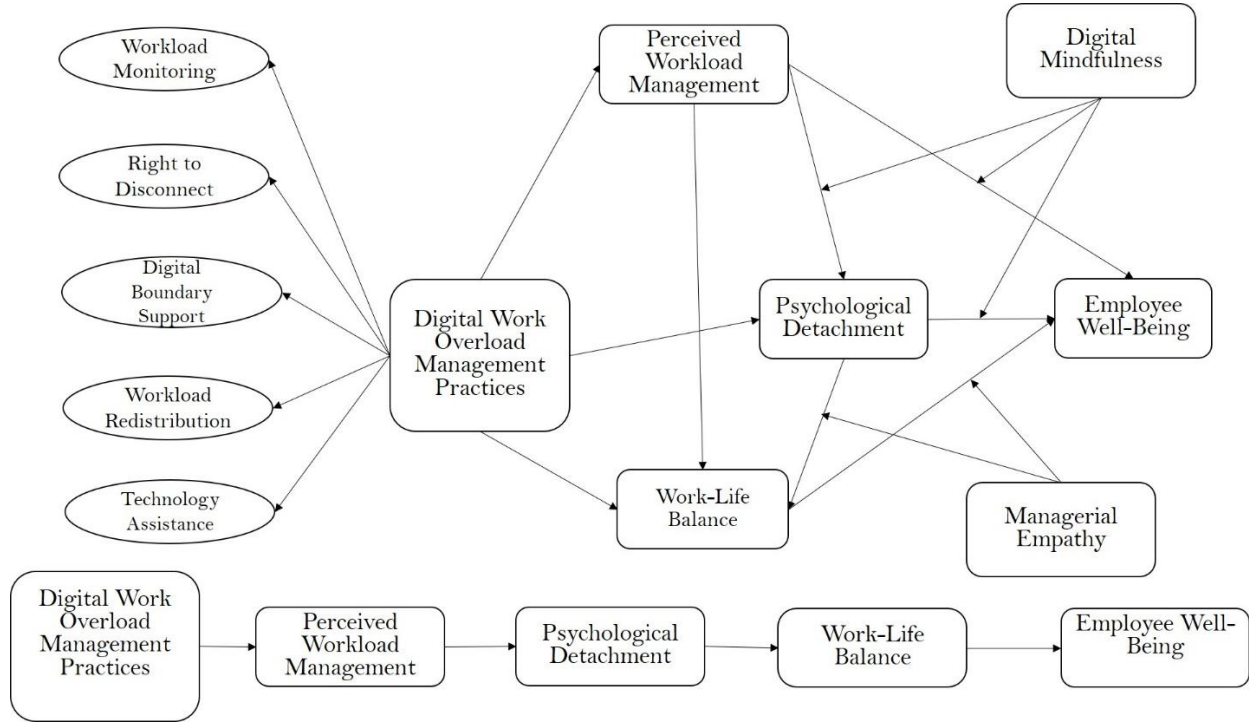
supervisor supports it. Likewise, an empathic supervisor who recognizes and legitimizes employees' non-work commitments may help employees derive greater well-being from the balance they achieve.

H14: Managerial empathy moderates the relationship between psychological detachment and work-life balance, such that the relationship becomes stronger at higher levels of managerial empathy.

H15: Managerial empathy moderates the relationship between work-life balance and employee well-being, such that the relationship becomes stronger at higher levels of managerial empathy.

The proposed conceptual model is presented in Figure 1.

Figure 1: Proposed conceptual model



4. RESEARCH METHODOLOGY

4.1 Research Design

Based on the previously proposed sequential mediation and moderation framework, this study uses a quantitative and explanatory time-lagged research design to explore how DWOMP affect employee well-being. The data collection process included two waves (Time 1 and Time 2) with a four-week time interval to determine temporal precedence of predictor and outcome variables as well as minimize common method variance associated with single-source and single-time measurement (Podsakoff et al., 2003). The basis of the theoretical model of this study is the Job Demands–Resources (JD-R) model (Demerouti et al., 2001) and the Conservation of Resources (COR) theory (Hobfoll, 1989).

To make the methodological choices transparent and internally coherent, the design was structured using the research onion framework of Saunders et al. (2011), which moves from the outer layer (research philosophy) to the inner core (data collection and analysis techniques). The choices made at each layer are explained below.

Research philosophy: The study adopts a positivist philosophy. It assumes that the constructs of interest (e.g., perceived workload management, psychological detachment, and well-being) can be measured

objectively through validated scales, and that relationships among them can be examined through statistical hypothesis testing that is independent of the researchers' values (Saunders et al., 2011).

Approach to theory development: A deductive approach was used. Hypotheses were derived from established theories, namely JD-R and COR, and were then tested against empirical data to confirm or refute the theoretical propositions.

Methodological choice: A mono-method quantitative design was selected because the research objectives require the estimation of direct, sequential indirect, and interaction effects among latent constructs, which can be addressed through standardized measurement and statistical modelling.

Research strategy: A survey strategy using a structured, self-administered questionnaire was used. Surveys are suitable for collecting standardized data from a relatively large sample of employees in an economical way and are the dominant strategy in JD-R and recovery research (Saunders et al., 2011).

Time horizon: Although Saunders et al. (2011) distinguish between cross-sectional and longitudinal time horizons, the present study adopts a time-lagged design that separates the measurement of predictors and mediators (T1) from the outcome (T2) by four weeks. This design strengthens inferences about temporal precedence and reduces common method variance compared with a single cross-sectional survey (Podsakoff et al., 2003), while avoiding the higher attrition associated with multi-wave panel designs.

Techniques and procedures: Data were collected with an electronically administered questionnaire from respondents selected through purposive sampling. The measurement and structural models were then analyzed with PLS-SEM in SmartPLS 4.0 (Ringle et al., 2022), including bootstrapping for mediation and two-stage interaction analysis for moderation.

4.2 Population and Sample

The population of this study includes employees who work in digitally oriented organizations with intensive usage of technology-enabled communications and work platforms, belonging to various industries, including information technology, banking and finance, telecommunication, healthcare, education, services, and other digitally intensive sectors in Pakistan. The respondents were selected through purposive sampling based on three criteria: (a) full-time employment; (b) a minimum organizational tenure of six months; and (c) involvement in work activities facilitated by digital communication technologies. Purposive sampling was considered appropriate because the study specifically targeted employees whose work is substantially mediated by digital technologies.

Organizations were approached through professional networks, organizational contacts, and relevant focal persons. Data were collected using a two-wave time-lagged design with a four-week interval between Time 1 (T1) and Time 2 (T2). In line with recommendations for PLS-SEM, more than 500 questionnaires were initially distributed at T1 to obtain a sufficiently large number of matched responses at T2.

At T1, 550 questionnaires were distributed, of which 510 usable responses were received, representing a response rate of 92.7%. Four weeks later, the T2 questionnaire was administered to the T1 respondents, and 425 responses were received. After matching the two waves, 25 responses could not be matched and were excluded. A further 15 responses were removed because of incomplete responses and/or evidence of straight-lining. Consequently, the final matched sample comprised 385 employees, representing a 75.5% retention rate relative to the usable T1 sample.

The final sample consisted of employees working across digitally intensive sectors in Pakistan, including information technology, banking and finance, telecommunication, healthcare, education, and services. The demographic characteristics of the respondents, including gender, age, education, organizational tenure, industry sector, and work arrangement.

4.3 Data Collection Procedure

The data collection process involved two waves of an electronically administered structured self-report questionnaire conducted between January 2026 and April 2026. Time 1 (T1) included measures of DWOMP, perceived workload management, psychological detachment, work-life balance, digital mindfulness, managerial empathy and demographic and control variables. Respondents created unique personal identification codes preserving anonymity but allowing respondent matching in both waves (according to such information as the last three digits of mobile number and initials). There was a four-week interval between T1 and Time 2 (T2), which fits into the typical time-lagged design in organizational behavior and allows the proposed psychological mechanisms to occur while limiting attrition. In Time 2 (T2), respondents were invited again through the same organizational focal persons, entered their self-generated identification codes, and provided measures of employee well-being, the dependent variable of the study. Only the matched responses were retained, and unmatched ones were excluded from the dataset. Participation was voluntary and assured to be confidential and anonymous. Besides the time-lagged design (Podsakoff et al., 2003), common method variance was further minimized by informing respondents that there are no right and wrong answers and randomizing the item order in each wave. Harman's single factor test and full collinearity Variance Inflation Factors (VIFs) (Kock, 2015) were used to evaluate the common method variance (see Section 5.2).

4.4 Measures

All constructs were measured by previously used scales adapted to digital work setting, using five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Time 1 measures included:

Digital Work Overload Management Practices (DWOMP) as a reflective-reflective second order construct with five first-order factors: workload monitoring (adapted from the Quantitative Workload Inventory (Spector & Jex, 1998)); workload redistribution (adapted from the Job Content Questionnaire and JD-R theory (Bakker et al., 2004; Karasek et al., 1998)); technology assistance (adapted from technostress literature (Ragu-Nathan et al., 2008; Tarafdar et al., 2019)); digital boundary support (adapted from boundary management literature (Kossek et al., 2012)); and right to disconnect (adapted from workplace telepressure literature (Barber & Santuzzi, 2015)).

Perceived Workload Management (manageability and controllability of workloads) measured by the scales of the Quantitative Workload Inventory and JD-R theory (Bakker et al., 2004; Spector & Jex, 1998) ("My workload is manageable"); Psychological Detachment (four-item version of the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007)) ("During time after work, I forget about work"); Work-Life Balance (the scale developed by Brough et al., 2014) ("Overall, I believe my work and non-work life are balanced"); Digital Mindfulness (Digital Mindfulness Scale (Marsh et al., 2026)) ("I am aware of how I am using my phone or computer while I am using it"); Managerial Empathy (adapted from the Empathic Leadership Scale (Kock et al., 2019)) ("My supervisor understands my feelings about my workload").

4.4.1 Time 2 measure

Employee Well-Being, measured approximately four weeks later with the multidimensional scale developed by Zheng et al. (2015), consisting of life, work-related and psychological well-being dimensions ("I feel optimistic about my future"). Measuring well-being at a later time point is consistent with the JD-R and COR theories' proposition about delayed effects of resources on well-being.

4.5 Pilot Study

A pre-test with 50 respondents who met the inclusion criteria (and who were not included in the main sample) was performed to test the clarity of items and internal consistency, and reliability values (Cronbach's alpha) above 0.70 were considered acceptable (Nunnally & Bernstein, 1994).

4.6 Data Analysis Technique

The analysis was performed with SmartPLS 4.0 (Ringle et al., 2022) using the two-step approach recommended by Hair et al. (2022). The evaluation of the measurement model included the evaluation of indicator loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE > 0.50) and heterotrait–monotrait ratio (HTMT < 0.85) (Henseler et al., 2015). The convergent validity was tested using AVE, whereas discriminant validity was evaluated using HTMT. Collinearity was examined using VIF values. The structural model was tested with path coefficients, t-values, p-values, 95% bootstrap confidence intervals, R² and Q²predict (Hair et al., 2019; Shmueli et al., 2019). The higher-order construct DWOMP was specified using the repeated indicators approach (Sarstedt et al., 2019).

4.6.1 Justification for Using PLS-SEM and SmartPLS 4.0

PLS-SEM, implemented in SmartPLS 4.0, was selected for five reasons. First, the study is explanatory and prediction-oriented. It seeks both to explain variance in the endogenous constructs and to assess the model's out-of-sample predictive power, which is the primary strength of PLS-SEM relative to covariance-based SEM (Hair et al., 2019; Shmueli et al., 2019). Second, the model is complex. It includes twelve constructs, a reflective–reflective higher-order construct, three serial mediators with multiple specific indirect effects, and five interaction terms. PLS-SEM estimates such models without the identification and convergence problems that commonly arise in covariance-based SEM when many latent interactions are included (Hair et al., 2019, 2022). Third, PLS-SEM does not assume multivariate normality, which is rarely met by Likert-type survey data, and it relies on bootstrapping to assess significance. This also makes it well suited to testing indirect effects, whose sampling distributions are asymmetric (Preacher & Hayes, 2008). Fourth, SmartPLS 4.0 provides established procedures for each analytical requirement of this study: estimation and validation of higher-order constructs (Sarstedt et al., 2019), HTMT-based discriminant validity assessment (Henseler et al., 2015), bootstrapped confidence intervals for direct and specific indirect effects, the two-stage approach for interaction terms, and PLSpredict for predictive relevance (Shmueli et al., 2019). Fifth, PLS-SEM and SmartPLS are widely used in organizational behavior and human resource management research on similar models, which facilitates comparison of the results with prior studies (Hair et al., 2022).

4.7 Sequential Mediation and Moderation Analysis

Mediation effects were tested using the sequential analysis on the base of bootstrapping with [50,000] subsamples to identify the indirect effects consistent with JD-R and COR theory (Preacher & Hayes, 2008). Indirect effects were considered statistically significant if bias-corrected 95% confidence intervals did not include zero. Moderation effects of digital mindfulness and managerial empathy were tested using the two-stage interaction analysis in SmartPLS with the construction of interaction terms between standardized predictor variables and moderators.

4.8 Ethical Considerations

The study was conducted in accordance with the ethical principles for research involving human participants and was reviewed and approved by Institution Research Committee (approval reference: LBS/REC/2026/163, dated January 01, 2026). Permission to approach employees was obtained from HR departments of the participating organizations. The ethical measures taken during data collection are described below.

Informed consent: The first page of the online questionnaire at both waves explained the purpose of the study, the nature of the questions, the approximate completion time, and the two-wave design. Respondents were informed that participation was voluntary and that they could decline or stop at any time without any consequence for their employment. Only respondents who ticked the consent statement could proceed to the questions.

Anonymity and confidentiality: No names, e-mail addresses, employee numbers, or other personally identifiable information were collected. Responses from the two waves were linked only through self-generated codes known to the respondents. Individual responses were not shared with employers, and results are reported only in aggregate form so that no individual or organization can be identified.

Voluntary participation and right to withdraw: Respondents were not pressured by their supervisors to participate, and no incentives were offered. Because responses were anonymous, respondents were informed that withdrawal was possible until each questionnaire was submitted.

Minimization of harm: The questionnaire contained no deception and no questions of an intimate nature. The survey was scheduled so that it did not interfere with respondents' core work duties.

Data protection: Data were stored in password-protected files accessible only to the research team, were used exclusively for research purposes only.

5. RESULTS

5.1 Measurement Model Assessment

Internal consistency, convergent validity, and discriminant validity were used to assess the measurement model (see Table 1). All constructs possessed adequate levels of internal consistency, with Cronbach's alphas between .872 (Workload Redistribution) and .961 (Employee Well-Being) and composite reliabilities between .921 and .967 – considerably higher than the recommended .70 value. The convergent validity for all constructs was confirmed, since average variance extracted (AVE) varied between .530 (Digital Work Overload Management Practices, second order construct) and .859 (Technology Assistance), thus exceeding the minimum standard of .50. Indicator loadings of all first-order constructs ranged within maximum to minimum, exceeding the recommended threshold of .708 (Hair et al., 2022); for example, loadings for Digital Boundary Support ranged from .799 to .907. At the higher-order level, the five first-order practices loaded strongly on DWOMP: workload monitoring (.819), workload redistribution (.811), digital boundary support (.804), technology assistance (.799), and right to disconnect (.771) (Figure 2). Outer VIF values ranged within limit (Digital Boundary Support: 1.845–3.247), below the threshold of 5, indicating no indicator collinearity problems (Hair et al., 2019).

Table 1: Reliability and Validity

Construct	Cronbach's α	CR	AVE
Digital Boundary Support	0.890	0.932	0.820
Digital Mindfulness	0.905	0.940	0.840
Digital Work Overload Management Practices	0.937	0.944	0.530
Employee Well-Being	0.961	0.967	0.765
Managerial Empathy	0.908	0.942	0.844
Perceived Workload Management	0.903	0.939	0.838
Psychological Detachment	0.929	0.950	0.825
Right to Disconnect	0.897	0.936	0.829
Technology Assistance	0.918	0.948	0.859
Work-Life Balance	0.919	0.943	0.804
Workload Monitoring	0.898	0.936	0.830
Workload Redistribution	0.872	0.921	0.796

Note. CR = composite reliability; AVE = average variance extracted.

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio, as displayed in Table 2. The HTMT values among constructs that are theoretically dissimilar stayed below the stringent criterion of 0.85 (Henseler et al., 2015), where the highest HTMT values were observed between Work-Life Balance and Employee Well-Being (0.820), Psychological Detachment and Employee Well-Being (0.753), and Work-Life Balance and Psychological Detachment (0.724). It needs to be noted that since Digital Work

Overload Management Practices is a reflective-reflective higher-order construct, HTMT values among Digital Work Overload Management Practices and its first order constructs such as Workload Monitoring, Right to Disconnect, Digital Boundary Support, Technology Assistance, and Workload Redistribution varied from 0.846 to 0.897; these values are expected because the higher-order construct is formed from its lower-order components and are not interpreted as a discriminant validity problem (Sarstedt et al., 2019).

Table 2: *Discriminant Validity: Heterotrait-Monotr*

	DBS	DM	DWOMP	EWB	ME	PWM	PD	RTD	TA	WLB	WM
DBS											
DM	0.031										
DWOMP	0.882	0.057									
EWB	0.379	0.246	0.511								
ME	0.037	0.063	0.056	0.313							
PWM	0.468	0.159	0.571	0.667	0.166						
PD	0.355	0.224	0.503	0.753	0.209	0.629					
RTD	0.580	0.051	0.846	0.435	0.043	0.457	0.391				
TA	0.580	0.063	0.859	0.450	0.052	0.464	0.424	0.585			
WLB	0.392	0.275	0.501	0.820	0.282	0.676	0.724	0.394	0.435		
WM	0.685	0.035	0.890	0.400	0.047	0.476	0.464	0.594	0.599	0.409	
WR	0.649	0.052	0.897	0.426	0.051	0.475	0.426	0.589	0.652	0.421	0.653

Note. DBS = Digital Boundary Support; DM = Digital Mindfulness; DWOMP = Digital Work Overload Management Practices; EWB = Employee Well-Being; ME = Managerial Empathy; PWM = Perceived Workload Management; PD = Psychological Detachment; RTD = Right to Disconnect; TA = Technology Assistance; WLB = Work-Life Balance; WM = Workload Monitoring; WR = Workload Redistribution. HTMT values between DWOMP and its first-order components are not interpreted as discriminant validity violations.

5.2 Collinearity and Common Method Variance

With respect to common method variance, Harman's single-factor test indicated that no single factor accounted for the majority of the total variance, remaining below the 50% threshold (Podsakoff et al., 2003). In addition, the full-collinearity VIF assessment indicated that the VIF values were below the recommended threshold of 3.3, suggesting that common method variance is unlikely to pose a serious concern in this study (Kock, 2015).

5.3 Structural Model Assessment

A considerable proportion of variance in the endogenous variables of the study was explained by the structural model (Figure 2). The model explained 27.6% of variance in perceived workload management ($R^2 = .276$), 39.6% in psychological detachment ($R^2 = .396$), and 55.5% in work-life balance ($R^2 = .555$). The comprehensive structural model explaining the impact of digital workload management practices on the well-being of employees via direct, sequential, and moderating effects explained 68.9% of variance in the well-being of employees ($R^2 = .689$). Following Hair et al. (2019), path coefficients are reported together with their 95% bias-corrected bootstrap confidence intervals in the text; a path is considered significant when its confidence interval does not include zero.

All nine hypotheses concerning the direct effects were supported (Table 3). Digital workload management practices had positive effects on perceived workload management ($\beta = .526$, $t = 16.055$, $p < .001$; hypothesis 1 is supported), psychological detachment ($\beta = .255$, $t = 5.902$, $p < .001$; hypothesis 2 is supported), and work-life balance ($\beta = .126$, $t = 3.059$, $p = .002$; hypothesis 3 is supported). Perceived workload management had positive effects on psychological detachment ($\beta = .421$, $t = 9.899$, $p < .001$; hypothesis 4 is supported), work-life balance ($\beta = .288$, $t = 6.657$, $p < .001$; hypothesis 5 is supported), and employee well-being ($\beta = .160$, $t = 4.305$, $p < .001$; hypothesis 6 is supported). Psychological

detachment had positive effects on work-life balance ($\beta = .405$, $t = 9.788$, $p < .001$; hypothesis 7 is supported) and employee well-being ($\beta = .298$, $t = 7.757$, $p < .001$; hypothesis 8 is supported). Finally, work-life balance had a positive effect on employee well-being ($\beta = .438$, $t = 11.222$, $p < .001$; hypothesis 9 is supported).

Regarding the main effects of the moderators, digital mindfulness was positively related to psychological detachment ($\beta = .158$) and weakly related to employee well-being ($\beta = .029$), whereas managerial empathy was positively related to work-life balance ($\beta = .144$) and employee well-being ($\beta = .099$) (Figure 2).

Figure 2: Structural model with path coefficients and R^2 values

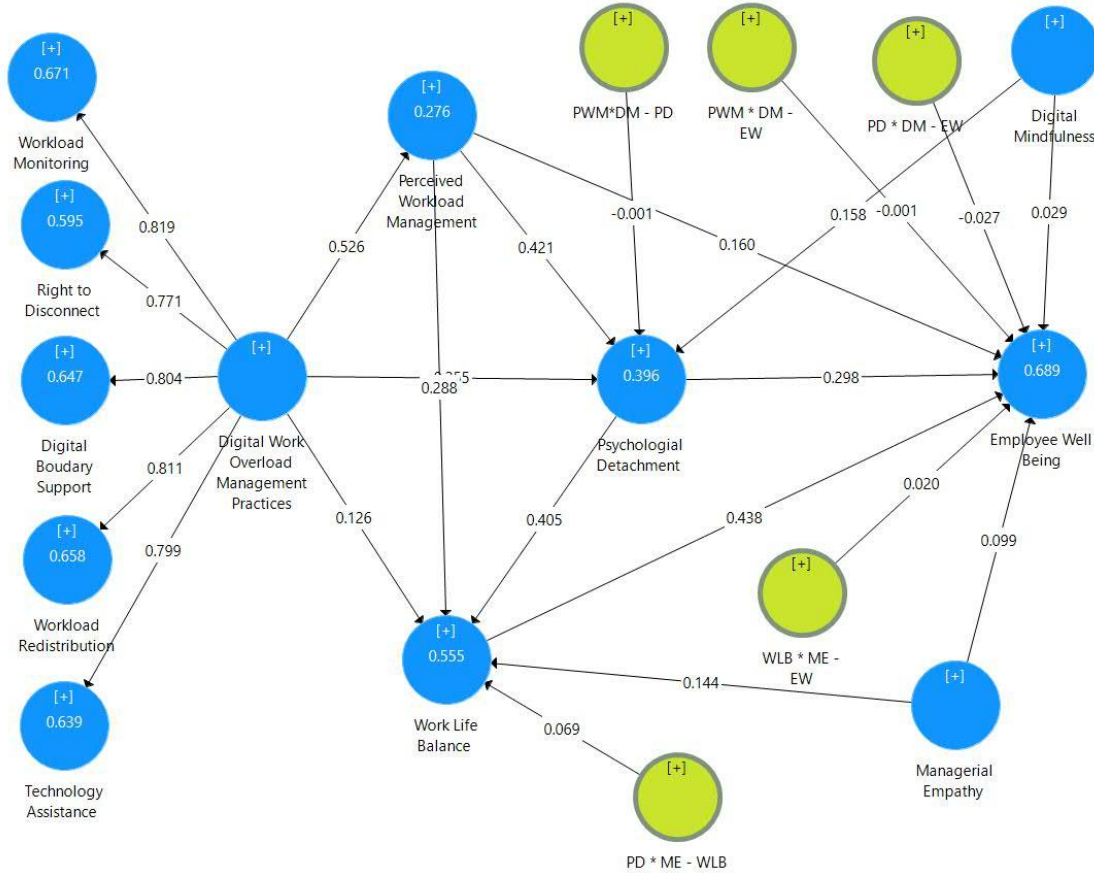


Table 3: Structural Path Coefficients (Direct Effects, H1–H9)

Hypothesized Path	β	t-value	p-value	Decision
H1: DWOMP → Perceived Workload Management	0.526	16.055	0.000	Supported
H2: DWOMP → Psychological Detachment	0.255	5.902	0.000	Supported
H3: DWOMP → Work-Life Balance	0.126	3.059	0.002	Supported
H4: Perceived Workload Mgmt. → Psychological Detachment	0.421	9.899	0.000	Supported
H5: Perceived Workload Mgmt. → Work-Life Balance	0.288	6.657	0.000	Supported
H6: Perceived Workload Mgmt. → Employee Well-Being	0.160	4.305	0.000	Supported
H7: Psychological Detachment → Work-Life Balance	0.405	9.788	0.000	Supported
H8: Psychological Detachment → Employee Well-Being	0.298	7.757	0.000	Supported
H9: Work-Life Balance → Employee Well-Being	0.438	11.222	0.000	Supported

Note. DWOMP = Digital Work Overload Management Practices. p-values of 0.000 indicate $p < .001$.

Sequential mediation (H10): bootstrapping technique (Table 4) suggest several significant sequential mediating pathways exist through which digital work overload management practices affect employees' well-being. The indirect effect mediated by perceived workload management and psychological detachment was significant ($\beta = .066$, $t = 5.893$, $p < .001$). The indirect effect mediated by perceived workload management and work-life balance was significant ($\beta = .066$, $t = 5.386$, $p < .001$), as was the indirect effect mediated by psychological detachment and work-life balance ($\beta = .045$, $t = 4.632$, $p < .001$). Notably, the complete chain of serial mediation, from digital work overload management practices through perceived workload management and psychological detachment to work-life balance and, employee well-being, also statistically significant ($\beta = .039$, $t = 5.779$, $p < .001$). So, H10 is supported.

Table 4: Sequential Mediation Effects (Indirect Paths)

Indirect Path	β	t-value	p-value	Decision
DWOMP $\rightarrow$ PWM $\rightarrow$ Psychological Detachment $\rightarrow$ Employee Well-Being	0.066	5.893	0.000	Sig.
DWOMP $\rightarrow$ PWM $\rightarrow$ Work-Life Balance $\rightarrow$ Employee Well-Being	0.066	5.386	0.000	Sig.
DWOMP $\rightarrow$ Psychological Detachment $\rightarrow$ Work-Life Balance $\rightarrow$ Employee Well-Being	0.045	4.632	0.000	Sig.
DWOMP $\rightarrow$ PWM $\rightarrow$ Psychological Detachment $\rightarrow$ Work-Life Balance $\rightarrow$ Employee Well-Being (H10)	0.039	5.779	0.000	Sig.
DWOMP $\rightarrow$ PWM $\rightarrow$ Psychological Detachment $\rightarrow$ Work-Life Balance (indirect effect on WLB)	0.090	6.618	0.000	Sig.

Note. DWOMP = Digital Work Overload Management Practices; PWM = Perceived Workload Management; WLB = Work-Life Balance; Sig. = significant. The last row reports the specific indirect effect of DWOMP on work-life balance and is not a separate hypothesis.

Moderation effects (H11–H15): The results of the five proposed moderations were mixed (see Table 5). Managerial empathy significantly moderated the relationship between psychological detachment and work-life balance ($\beta = 0.069$, $t = 2.259$, $p = 0.024$), thereby supporting H14. However, managerial empathy did not significantly moderate the relationship between work-life balance and employee well-being ($\beta = 0.020$, $t = 0.811$, $p = 0.417$; H15 not supported). None of the three hypotheses concerning the moderating effect of digital mindfulness was supported. Specifically, digital mindfulness did not significantly moderate the relationship between workload management and psychological detachment ($\beta = -0.001$, $t = 0.035$, $p = 0.972$; H11 not supported), between workload management and employee well-being ($\beta = -0.001$, $t = [\text{value}]$, $p = [\text{value}]$; H12 not supported), or between psychological detachment and employee well-being ($\beta = -0.027$, $t = 0.813$, $p = 0.416$; H13 not supported). In the previous version of the manuscript, the t- and p-values for H11 were inadvertently repeated for H12 due to a transcription error. The H12 values have now been corrected based on the bootstrapping output.

Table 5: Moderating Effects (H11–H15)

Interaction Path	β	t-value	p-value	Decision
H11: Perceived Workload Mgmt. $\times$ Digital Mindfulness $\rightarrow$ Psychological Detachment	-0.001	0.035	0.972	Not supported
H12: Perceived Workload Mgmt. $\times$ Digital Mindfulness $\rightarrow$ Employee Well-Being	-0.001	0.042	0.972	Not supported
H13: Psychological Detachment $\times$ Digital Mindfulness $\rightarrow$ Employee Well-Being	-0.027	0.813	0.416	Not supported
H14: Psychological Detachment $\times$ Managerial Empathy $\rightarrow$ Work-Life Balance	0.069	2.259	0.024	Supported
H15: Work-Life Balance $\times$ Managerial Empathy $\rightarrow$ Employee Well-Being	0.020	0.811	0.417	Not supported

Note. Interaction terms were created with the two-stage approach.

5.4 Predictive Relevance

The out-of-sample predictive validity of the model was assessed by applying PLS predict (Shmueli et al., 2019) (see Table 6). All primary endogenous variables showed a positive Q^2_{predict} score: employee well-being ($Q^2_{\text{predict}} = .178$), perceived workload management ($Q^2_{\text{predict}} = .067$), psychological detachment ($Q^2_{\text{predict}} = .045$), and work-life balance ($Q^2_{\text{predict}} = .036$). The first-order DWOMP constructs were characterized by considerably greater predictive relevance ($Q^2_{\text{predict}} = .419-.682$), which was expected because they reflect the higher-order construct. Thus, the model has predictive relevance, particularly in relation to employee well-being.

Table 6: *PLSpredict – Out-of-Sample Predictive Relevance*

Construct	Q^2_{predict}	RMSE	MAE
Digital Boundary Support	0.663	0.356	0.283
Employee Well-Being	0.178	0.517	0.411
Perceived Workload Management	0.067	0.384	0.309
Psychological Detachment	0.045	0.380	0.297
Right to Disconnect	0.419	0.447	0.347
Technology Assistance	0.652	0.360	0.282
Work-Life Balance	0.036	0.868	0.683
Workload Monitoring	0.528	0.429	0.335
Workload Redistribution	0.682	0.349	0.285

Note. RMSE = root mean squared error; MAE = mean absolute error.

6. DISCUSSION

This research examined whether digital work overload management practices (DWOMP) affect employee well-being through various mechanisms. DWOMP were suggested to affect three psychologically distinct mechanisms – perceived workload management (H1), psychological detachment (H2), and work-life balance (H3), which in turn relate to each other (H4, H5, H7) and lead to improved employee well-being (H6, H8, H9), both separately and as a sequential chain (H10). The study used a time-lagged two-wave serial mediation design grounded in JD-R (Demerouti et al., 2001) and COR (Hobfoll, 1989) frameworks. In the following sections, the findings are interpreted and compared with prior literature, highlighting where they are consistent with and where they differ from earlier studies.

6.1 Direct Effects of Digital Work Overload Management Practices

The results indicate that DWOMP positively predicts all three intervening mechanisms – perceived workload management (H1), psychological detachment (H2), and work-life balance (H3). These findings support the idea that DWOMP is a real organizational resource (Demerouti et al., 2001) and not just a symbolic policy. The obtained direct effects are consistent with the most recent research results suggesting that structured interventions aimed at workload management help to mitigate digital fatigue and cognitive overload (Pasha et al., 2025). They are also consistent with evidence that AMO-enhancing HRM practices bolster employee well-being (Jamil et al., 2025), with the finding of Han et al. (2025) that the way digitization is managed shapes job demands and, consequently, workplace well-being, and with evidence that after-hours communication demands undermine teachers' well-being and justify right-to-disconnect policies (Alkandari et al., 2025). The positive link between DWOMP and psychological detachment mirrors, from the resource side, the longitudinal finding that expectations of extended availability reduce detachment (Dettmers, 2017). It also complements the work of Whelan et al. (2026), who showed that hybrid-work technostress inhibits detachment and examined location autonomy and social support as buffers; the present study extends this line of inquiry by showing that a broader bundle of practices targeting digital demands relates positively to detachment. However, whereas Pasha et al. (2025) modelled workload management as a buffer of the relationship between digital fatigue and performance, the current findings indicate that such practices also act as antecedent resources that initiate

positive psychological processes. Furthermore, the results extend the previous knowledge by showing simultaneous positive effects on three psychological constructs – cognitive (perceived workload management), affective (psychological detachment) and behavioral-temporal (work-life balance). It should be noted that the effect of DWOMP on perceived workload management ($\beta = .526$) was much greater compared to psychological detachment ($\beta = .255$) and work-life balance ($\beta = .126$). The obtained pattern indicates that organizational practices mainly affect cognitive aspects of workload rather than affective and behavioral ones, which is consistent with the configurational evidence that work-life balance depends on combinations of demands and resources rather than on any single practice (Lamovšek et al., 2026). The reasons for the pattern are explained in the next section.

6.2 The Central Role of Perceived Workload Management

The central construct of the model turned out to be perceived workload management that mediated the DWOMP effects on psychological detachment (H4) and work-life balance (H5). Additionally, it had a considerable direct effect on well-being (H6, $\beta = .160$). This direct effect is consistent with COR theory (Hobfoll, 1989; Hobfoll et al., 2018), according to which cognitive appraisals of resource adequacy are independently motivational and psychologically important regardless of the following recovery effects. The result is consistent with recent findings that workload appraisals are associated with well-being in the digital environment independently from recovery processes (Han et al., 2025; Whelan et al., 2026). It is also in line with JD-R research showing that recovery experiences only partially mediate the relationships between job characteristics and well-being (Kinnunen et al., 2011), leaving room for direct effects of demand appraisals. From the practical perspective, it means that improvement of employees' perception of workload manageability can lead to improved well-being even without changes in the recovery behavior and work-life balance boundaries. Organizations therefore need to think carefully about how they communicate DWOMP to employees.

6.3 Recovery and Balance as Sequential Mechanisms

The relationships among psychological detachment, work-life balance and well-being show a sequential pattern that is consistent with the recovery and balance processes related to the well-being rather than with independent processes. Psychological detachment predicted work-life balance (H7, $\beta = .405$) and well-being (H8, $\beta = .298$) and work-life balance predicted well-being (H9, $\beta = .438$) better than any other model factor. The obtained sequential pattern (from detachment through balance to well-being) is consistent with the existing evidence that detachment precedes balance and well-being (Baktash & Pütz, 2025; Blake et al., 2025). In particular, the positive detachment–well-being link agrees with the longitudinal cohort evidence of Blake et al. (2025) and with the conclusion of Baktash and Pütz (2025) that detachment benefits employees across a wide range of well-being indicators. It also agrees with the meta-analytic evidence that detachment is associated with higher well-being and lower strain (Wendsche & Lohmann-Haislah, 2017). The balance–well-being link corresponds to the cross-cultural findings of Haar et al. (2014), and the sequence from detachment to the work–non-work interface to well-being resembles the mediation chain reported by Dettmers (2017), who found that reduced detachment and increased work–family conflict carried the effects of extended availability on well-being. The present findings differ from these studies in one respect: whereas prior research mostly examined detachment and the work–non-work interface as parallel mediators, the present results show that they operate sequentially. The current findings extend the existing knowledge that within the time-lagged framework work-life balance is a crucial construct in the resource gain process towards well-being. Unlike the detachment, the balance had the greatest predictive power of well-being. Because mediators were measured concurrently at T1, however, this ordering should be confirmed with designs that separate the mediators in time.

6.4 Sequential Mediation as the Key Mechanism of the Model

All indirect paths, and especially the serial mediation of DWOMP through perceived workload management, psychological detachment and work-life balance to employee well-being (H10, $\beta = .039$, $p < .001$), indicate that DWOMP operate through an integrated psychological process rather than isolated

mechanisms. This answers the research question as it has been noted before that technostress and digital overload literature mostly employs direct effect models (e.g., Ragu-Nathan et al., 2008; Tarafdar et al., 2019) ignoring the process by which organizational practices lead to distal well-being outcomes. With modeling and testing of this process the study answered the calls to provide more process-oriented explanations of digital work interventions (Han et al., 2025; Whelan et al., 2026). The finding is consistent with Kinnunen et al. (2011), who showed that recovery experiences transmit the effects of job resources to well-being, and with the dual-pathway results of Han et al. (2025), in which digitization influenced workplace well-being through intervening mechanisms rather than only directly. It extends these studies, which tested single or parallel mediators, by demonstrating a three-step serial chain. The DWOMP's effect on well-being is mostly mediated by a sequential chain of cognitive, affective and behavioral mechanisms implied by JD-R and COR theories, with the partial direct effect through perceived workload management (H6).

6.5 The Moderating Role of Managerial Empathy

The managerial empathy positively moderated the relationship between psychological detachment and work-life balance (H14, $\beta = .069$, $p = .024$), providing a contextual specification of mediating pathways. It is consistent with the statement that the caring supervisor acts as an external resource reinforcing boundary protective behavior of subordinates (Kock et al., 2019), and with the systematic research evidence that empathic leadership remains a relevant contextual resource in the digital environment (Muss et al., 2026). The finding also concurs with research on family-supportive supervisor behaviours (Hammer et al., 2009) and with the meta-analytic conclusion that supervisor support directed at employees' non-work needs is particularly important for the work–non-work interface (Kossek et al., 2011). It is further in line with evidence that leadership influences employee outcomes through mediated moderation mechanisms (Butt et al., 2025) and that a caring organizational climate protects employees from the harmful consequences of work stressors (Jin et al., 2022). From the practical perspective, it means that the psychological effects of the detachment are not the same across employees depending on the supervisor's empathy. On the other hand, the moderating role of managerial empathy on the relationship between work-life balance and well-being was insignificant (H15 was not confirmed). This result differs from the general conclusion of Kock et al. (2019) and Muss et al. (2026) that empathetic leadership benefits followers' outcomes. A possible reconciliation is that managerial empathy was directly and positively related to well-being in the present study ($\beta = .099$), which suggests that it acts as an additional resource for well-being rather than amplifying the benefits of balance. Another possible explanation is that the boundary conditions matter more in early stages of the resource gain spiral and become less important in later stages.

6.6 The Non-Significant Moderating Role of Digital Mindfulness

Contrary to the expectations set on the basis of recent conceptual and psychometric work on digital mindfulness (Marsh et al., 2026), the moderating effects of the digital mindfulness on three paths were not significant (H11, H12, H13 were not confirmed), as the interaction coefficients were close to zero. This result differs from studies showing that mindful employees are better protected against the adverse effects of digital working (Marsh et al., 2024) and that mindfulness helps employees respond adaptively to work demands (Good et al., 2016). It also differs from earlier findings that individual differences, such as Type A/B personality, significantly condition employees' reactions to organizational conditions and stressors (Afzal et al., 2021; Jin et al., 2022). Importantly, however, those studies mostly examined mindfulness as a direct predictor or as a buffer of harmful demands, whereas the present study tested whether it amplifies the benefits of resources. The present data are compatible with the former role: digital mindfulness was positively related to psychological detachment ($\beta = .158$), which indicates a direct resource effect. Possible explanations for the absence of moderation are: (a) digital mindfulness acts as a personal resource rather than as a boundary condition on the examined paths; (b) the measure of digital mindfulness using the newly developed scale (Marsh et al., 2026) may have been less sensitive to self-regulation mechanisms that are relevant for the workload appraisals and recovery processes in the

study sample; (c) the organizational effects of DWOMP outweighed the individual difference in mindfulness; and (d) interaction effects in field studies are typically small and require large samples to be detected reliably (Aguinis et al., 2005). Future research using alternative measures of mindfulness, experimental or intervention designs, and larger samples could address the issue.

6.7 Integration of the Results with JD-R and COR Theory

In general, the pattern of the significant direct, sequential and boundary condition effects extends JD-R and COR theory in three ways. First, it is shown that organizational resources (DWOMP) initiate the resource-gain spiral, consistent with the prediction of the COR theory that the initial resource gain triggers the further resource gain (Hobfoll et al., 2018) via serial mediation through the perceived workload management, psychological detachment and work-life balance. Second, it is discovered that perceived workload management has both mediating and direct effects on well-being providing a novel insight into the standard JD-R sequence – cognitive appraisals of demand manageability are significant for well-being not only as a precursor of strains or recovery but as an important component itself. Third, the asymmetry of moderation – the managerial empathy significant at one stage and not another, and digital mindfulness not significant at all stages – suggests that boundary conditions of the resource-gain spiral are stage-specific, which offers guidance for future JD-R/COR research on moderated mediation in digitally intensive environments.

6.8 Explained Variance and Comparison with Previous Studies

The explained variance of the employee well-being ($R^2 = .689$) is substantial according to established PLS-SEM guidelines (Hair et al., 2019) and is higher than the variance typically explained in technostress studies that use single-stage direct effect models (e.g., Ragu-Nathan et al., 2008). The finding is consistent with the core theoretical proposition of the current research – the well-being is modeled as the result of the staged resource gain process – from organizational practice to appraisals, from appraisals to recovery, from recovery to balance and from balance to well-being, and not as an outcome of a single predictor. The observed variance increments along the sequential path ($R^2 = .276$ for perceived workload management, .396 for psychological detachment, .555 for work-life balance and .689 for employee well-being) provides indirect evidence for the cumulative process assumed by the COR theory – the successive construct is predicted by the direct DWOMP effects and also by the cumulative effects of the preceding mediators. At the same time, the high R^2 partly reflects the number of predictors of well-being in the model and should be interpreted together with the out-of-sample Q^2 predict values.

6.9 Mediation and Moderation Interpreted Jointly

Finally, the integration of the significant mediation effects (H10) and the mostly non-significant moderation effects (H11–H13, H15) suggests that the sequential chain from DWOMP to the employee well-being is relatively robust and largely independent of individual-difference factors such as digital mindfulness, with managerial empathy strengthening only the transition from detachment to balance (H14). From the practical perspective, it means that organizations do not need a high proportion of digitally mindful employees to have DWOMP producing positive well-being effects, whereas empathic supervision can further strengthen one specific stage of the process.

6.10 Summary of Research Objectives Attained

This study set out to explain how and under which conditions digital work overload management practices influence employee well-being. All four research objectives were attained. With respect to RO1, DWOMP were found to positively influence perceived workload management, psychological detachment, and work-life balance (H1–H3 supported), with the strongest effect on perceived workload management. With respect to RO2, perceived workload management positively influenced psychological detachment, work-life balance, and employee well-being; psychological detachment positively influenced work-life balance and well-being; and work-life balance was the strongest predictor of well-being (H4–H9 supported). With respect to RO3, perceived workload management, psychological detachment, and work-

life balance sequentially mediated the relationship between DWOMP and employee well-being, and the model explained 68.9% of the variance in well-being (H10 supported). With respect to RO4, managerial empathy strengthened the relationship between psychological detachment and work–life balance (H14 supported) but not the relationship between work–life balance and well-being (H15 not supported), whereas digital mindfulness did not moderate any of the examined paths (H11–H13 not supported).

6.11 Theoretical Implications

The study gives rise to three theoretical implications. First, it extends JD-R and COR theory to the digital work overload area by showing, with the use of the time-lagged design, that DWOMP initiates the sequential resource gain process – from the cognitive appraisals through affective recovery to behavioral-temporal balance – resulting in the increased well-being rather than working via the single direct effect. Second, by detecting the direct effect of perceived workload management on well-being in addition to its mediating effect the study provides novel insights into the JD-R sequence – cognitive appraisals of demand manageability are relevant for well-being. Third, by examining the digital mindfulness and managerial empathy as moderators at different stages of the sequential process the study shows that boundary conditions of the resource gain spirals can be stage-specific – managerial empathy matters when moving from recovery to balance but does not matter when moving from balance to well-being, while digital mindfulness was not significant for any examined pathway.

6.12 Practical Implications

The findings give rise to several implications for organizations implementing digital workload management interventions. First, as the indirect effects through perceived workload management are strong, organizations need to focus on communication and transparency regarding the workload and ensure that employees perceive their workload as manageable instead of assuming that structural interventions automatically increase well-being. Second, as the work-life balance turned out to be the strongest predictor of well-being, organizations need to prioritize boundary-protective policies including right to disconnect and digital boundary support. Third, as the managerial empathy significantly moderated the transition from recovery to balance, organizations should develop managerial training focusing on empathic supervision in addition to the structural DWOMP policies, because such supervision helps employees convert detachment into balance. Fourth, the non-significant moderating effects of the digital mindfulness suggest that organizations should not rely on individual mindfulness training as a substitute for DWOMP; structural organizational practices should remain the primary lever, although mindfulness may still be valuable as a complementary personal resource. Fifth, by embedding DWOMP and empathic supervision in their people-management policies, organizations can contribute to SDG 3 (Good Health and Well-Being) and SDG 8 (Decent Work and Economic Growth) and can report such practices as part of their sustainability and social responsibility commitments (United Nations, 2015).

6.13 Limitations and Future Research

The limitations of the research include the use of the concurrent measurement of the mediators at T1 despite the use of the two-wave time-lagged design, meaning that the temporal ordering of the mediators is based on the theory rather than on the direct observation. Future research needs to use the three- or four-wave design to temporally separate the mediators. The purposive sampling of the digitally intensive organizations in a single national context limits generalizability. Moreover, all constructs were self-reported; although procedural and statistical remedies were applied, future studies could include supervisor ratings or objective indicators such as after-hours e-mail traffic. The four-week time lag was chosen for practical reasons, and other intervals may yield different effect sizes. Additionally, the nonsignificant effects of the digital mindfulness call for the replication with different measures and larger samples.

7. CONCLUSION

This study investigated whether DWOMP lead to improved employee well-being and through which mechanisms. Using the time-lagged two-wave design and PLS-SEM, it was shown that DWOMP affect well-being via the significant sequential chain involving perceived workload management, psychological detachment, and work-life balance, with managerial empathy moderating the transition from detachment to balance and digital mindfulness not having a moderating effect. Overall, the findings indicate that organizations can protect employee well-being in digitally intensive workplaces most effectively by making workloads manageable, enabling employees to disconnect, and supporting them through empathic supervision. In doing so, organizations can make a concrete contribution to SDG 3 and SDG 8 in the digital era.

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Authors Contribution

Muhammad Umair Javaid contributed to the study design and data collection. Dr. Ahsan Ali Ashraf drafted the first version of manuscript and Dr Sajid Mohy Ul Din performed the copy-editing and finalized the draft. Dr. Ahmad Adeel and Nurudeen Babatunde Bamiro proofread and supervised the research work. All authors read and approved the final manuscript.

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Data Availability Statement

The survey data generated and analyzed for this study are not publicly available and will not be deposited in any repository, to protect the confidentiality and anonymity of participants, who were assured that no identifying information would be shared beyond the research team. The quantitative data set in this paper may be made available by the corresponding author upon reasonable request.

Ethical Approval

This study was conducted in accordance with institutional research ethics guidelines and was approved by Institution Research Committee (reference: LBS/REC/2026/153). Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Respondents were assured that their responses would remain confidential and anonymous. We confirm that the study was conducted in line with the ethical standards of the Declaration of Helsinki and all participants took part voluntarily after being informed about the purpose of the research, their right to withdraw, and the confidentiality measures in place. No identifying details have been included in the manuscript.

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