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From Strain to Sustainability: Impact of Job Demands and Job Resources on Employee Digital Wellbeing in Service Sector of Pakistan

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Abstract

The paper aims to test the results of job demands and job resources on employee digital wellbeing in the service sector of Pakistan, with technostress and employee engagement as the mediating factors. The research is grounded on the Job Demands-Resource model with purpose to explore the effects of digital workplace environment on the wellbeing of personnel in technology-based institutions/companies, the banking as well as IT industries. A time-lagged survey approach was adopted for data collection using questionnaires, 166 responses were included for the study after the responses were received in two waves. Data analysis was performed by the help of SPSS including Hayes PROCESS Macro. Conclusions showed, Job Demands have a substantial negative upshot on employee digital wellbeing, while job resources have a noteworthy positive influence on employee digital wellbeing. Job demands were absolutely related to technostress, while technostress was adversely related to employee digital wellbeing. Mediation analysis displayed, technostress partially mediated the association between job demands and employee digital wellbeing. Job Resources positively predicted employee engagement, while employee engagement positively predicted employee digital wellbeing. Moreover, employee engagement partially mediated the association between job resources & employee digital wellbeing. The discoveries maintained the JD-R theory as they showed that job demands acted as strain factors through technostress, while job resources acted as motivational factors through employee engagement. The research concludes that organizations in the digitally intensive service sector should strive to reduce digital demands while increasing positive work resources to improve employees digital well -being.

Keywords: job demands, job resources, technostress, employee engagement, employee digital well-being

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Introduction

Rapid digitalization has increased the dynamics in the work processes of the banking and IT industries; hence, there is increased ICT usage for the organization's staff. "Job demands-resources theory" offers comprehensive model regarding appreciative the connection concerning the role played by technology in the organization of the workplace and the consequent special effects regarding the health, motivation with performance of the organizations employees. "Job demands-resources theory" asserts that the effects of technology on the place of work have a momentous influence on the health and motivational potential of the organizations staff (Lesener, 2019; Pansini et al., 2023; Scholze & Hecker, 2023). Demands in the digital workplace include techno overload and increased connectivity. On the other hand, resources in the digital workplace include ICT-enabled autonomy, ICT-enabled cooperation, and ICT-enabled performance feedback. Recent extensions to the JD-R method have resulted to concept related "digital job demands and resources" which tells clearly positioned the character of digitization regarding "bright side" and "dark side" pertains to employee well-being (Scholze & Hecker, 2023).

Technostress is a stress arising from the use of technology through techno overload, complexity, insecurity and uncertainty has emerged like a central digital job demand that impairs wellbeing via health impairment processes (Alkhayyal & Bajaba, 2024; Wang, 2023). At the same time, employee engagement has emerged consistently as being linked with job resources towards the "motivational pathway" of the "JD-R model" which viewed as an important tool with resources convert into positive aftermaths and innovative behavior (Koroglu & Ozmen, 2021; Lee & Jo, 2023; Zia et al., 2025). Synthesizing these insights, the present study explores how JDs and JRs influence EDWB among employees in the Pakistan banking and IT sectors, and tests technostress as mediator between JDs & EDWB, and EE (employee engagement) as mediator between JRs and EDWB.

The dynamic developments observed in service sector organizational digitalization processes have significantly altered work processes and performance requirements, thereby increasing the significant role played by JDs and JRs. The "JD-R model" has indicated damaging part lead by high job demands on the psychological dynamisms available to the employee (Bakker & Demerouti, 2007; Demerouti et al., 2001). Technostress has also significantly played the role of a mediator linking digital job demands to the

psychological condition and well-being of personnel (Molino et al., 2020). On the opposite side, job resources like digital facilitation role play a dynamic part in increasing EE (employee engagement), thereby positively influencing EWB (Bakker & Demerouti, 2017; Xanthopoulou et al., 2009).

In Pakistan, service sector-including education, banking, telecommunications, and public services-has accelerated in digital transformation. However, such a transition has also increased digital workload, blurred work-life boundaries and intensified performance pressures. Although previous research in Pakistan largely examined employee wellbeing in general terms, such as stress, burnout, and job satisfaction, limited attention has been given to employee digital wellbeing as a distinct construct that is shaped by digital job demands and resources. Furthermore, the psychological processes by which digital work conditions influence wellbeing-specifically, the mediating roles of technostress between JDs and EDWB, and employee engagement between JRs and employee digital wellbeing-are also not well examined. The lack of experimental proof limits the expansion of theory-driven and contextually relevant interventions for sustaining digital wellbeing in Pakistans service sector.

The literature has empirically researched and discussed digital wellbeing, technostress and "JD-R model" in perspective of technology-enabled organizations globally; however, most of the literature represents studies conducted within Western and developed economies (Bakker et al., 2023; Molino et al., 2020; Tarafdar et al., 2007). Academic literature within Pakistan's context reveals that researchers have focused primarily on employee wellbeing, workplace stress, burnout, and job satisfaction; as such, there have been no empirical research studies conducted on digital wellbeing or technostress issues in the context of technology-enabled service organizations. Literature divulges a lack of realistic analysis on mediation roles related to technostress in employee wellbeing, revealing how technostress might mediate the relationship between JDs and EDWB, along with employee engagement in revealing how job resources impact digital wellbeing. Furthermore, limited literature could be found within Pakistan's context on extending "JD-R model" to EDWB discoveries. This research objective is bridging the critical gap in present studies, with extension of "JD-R model" in perspective of EDWB.

Research Objectives

- To identify the impact of "job demands on employees digital well-being" of personnel working in Service Sector of Pakistan.
- To investigate that if Technostress mediate the association between "job demands on employees digital well-being".
- To scrutinize the impact of "job resources on employees digital well-being" of personnel working in Service Sector of Pakistan.
- To check if Employee Engagement mediate the relationship between "job resources on employees digital well-being".

Research Questions

- What is the impact of "job demands and job resources on employees digital well-being" of personnel working in Service Sector of Pakistan?
- Does Technostress mediate the association between "job demands on employees digital well-being"?
- Does Employee Engagement mediate the relationship between "job resources on employees digital well-being"?

Significance of the Study

This research is theoretically important because it broadens the scope for the "Job Demands-Resources (JD-R) model" (Bakker et al., 2023; Demerouti et al., 2001) from the less investigated area of employee digital wellbeing within the service industry of Pakistan, a developing economy where the accentuation of digitalization is rising the demands for employees. It is significant since it extends the "JD-R model" from direct effects to mediational effects where the mediators are technostress and employee engagement, which provide evidence for the process model of JD-R for digital employee wellbeing outcomes (Molino et al., 2020; Xanthopoulou et al., 2009). This research have operational consequences for service organizations and policymakers in the identification of technostress as a critical risk pathway undermining digital wellbeing and employee engagement as a key protective mechanism enhancing wellbeing.

Literature Review

Job demands (JDs)

In footings of the "Job Demands-Resources (JD-R) Model", JDs, demands that are associated with "physical, psychological, social as well as organizational aspects of work", leads to "physiological and psychological costs", and which can include workload, time pressure, role conflict, job insecurity, and, in virtual work, technology overload and complexity (Bakker & Demerouti, 2024; Han, 2025; Scholze & Hecker, 2023). Employee having high JDs experience exhaustion, activating the health impairment process that results in strain and low WellBeing (Han, 2025). Empirical findings have supported the link that the digitalization in the modern workplace results in specific digital job demands may cause stress in the employees and impact SWB (Marsh et al., 2024).

Job Resources (JRs)

JRs are components that help in enabling employees to cope with stresses to attain work goals (Bakker & Demerouti, 2024; Han, 2025). They include leadership, feedback and development opportunities; and for ICT jobs or digital workplaces, ICT-enabled autonomy, collaboration, and communication (Albrecht et al., 2021; Marsh et al., 2024). "JD–R theory" indicates, there is a micro process of motivation that involves work resources, which stimulate work engagement, leading to achievement outcomes and wellbeing (Bakker & Demerouti, 2024; Bakker et al., 2023). In the digitalized context, the process of work digitization would likely enhance job resources, which, through work engagement, would stimulate wellbeing among workers (Albrecht et al., 2021; Zeshan et al., 2025).

Employees Digital Well -Being (EDWB)

Employee digital wellbeing is defined as employees' psychological wellbeing with regard to their use of digital technologies at work how healthy, balanced, and sustainable their ICT-enabled work experience is (Alkhayyal & Bajaba, 2024; Wang, 2023). It is considered a work technology component of overall workplace wellbeing. Digital wellbeing as a research focus is in development, informed by both JD-R and technostress paradigms. Digital workplace JDs are like hyper-connectivity, techno overwhelm and techno strain have been empirically linked through qualitative assessments (Marsh et al., 2024).

Technostress (TechS)

Technostress is the type of strain that emerges as a consequence of the use of information/ technologies. It usually involves techno overload, complexity and uncertainty (Pansini et al., 2023; Wang, 2023). It includes negative psychological and physiological responses that usually result as a consequence of information overload and the uncontrolled use of ICTs. Placed within the "JD-R model", technostress being typically reflected a technology-related JDs who drains emotional/physical resources, causing ill-being (Wang, 2023).

Employee Engagement (EmpEng)

Employee engagement is refer to the optimistic, satisfying, workplace state categorized by vigor, devotion and immersion in employment (Mazzetti et al., 2023). It illustrations a greater level of energy, involvement along concentration in enactment of profession. Engagement refers to focal outcome of the JD-R development proposed by "JD-R theory", influenced mainly by occupation and personal resources instead of low JDs (Bakker & Demerouti, 2024).

Job Demands, Technostress, and Employee Digital Wellbeing

The health impairment procedure of "JD-R model" proposes, high heights of digital JDs cause depleting effects on employees, resulting in strain, burnout, and decreased health. In digital work contexts, digital workplace job demands like hyperconnectivity, techno overwhelm and techno strain have emerged as digital job demands that are detrimental to employee health (Marsh et al., 2024; Scholze, 2024). The theoretical extensions of JD-R in digital contexts propose digital JDs like constant accessibility along work amplification as new dimensions of digital job demands that cause heightened levels of stress and negatively affect employee health, provided they are not compensated with resources. A comprehensive review of "JD-R theory-based" research revealed, existing body of research primarily viewed ICT as a job demand that was detrimental to wellbeing, causing burnout, and impacting job attitudes and performance (Pansini et al., 2023). However, empirical research revealed that technostress had an adverse impact on work-related wellbeing in terms of emotional/physical exhaustion (Alkhayyal & Bajaba, 2024; Wang, 2023). It can, therefore, be deduced that in an increasingly technologically

advanced banking and IT industry, job demands have an influence on technostress, leads towards negative affects od EDWB.

H1: Job Demands (JDs) have a negative impact on Employee Digital Wellbeing (EDWB).

H3a: Job demands (JDs) have a positive relationship with technostress.

H3b: Technostress is negatively linked with employee digital well-being (EDWB).

H3c: Technostress mediate the association between job demands (JDs) and employee digital wellbeing (EDWB).

Job Resources, Engagement, and Employee Digital Wellbeing

Motivational sequence proposed in "JD-R model", resources found to consistently enhance work engagement and well-being outcomes (Lesener, 2019; Zeshan et al., 2025). In the digital workplace, digitalization provides opportunities to increase resources that would lead to enhanced work engagement and well-being outcomes. For instance, digitalization in work life has been shown to contribute to autonomy, feedback, and participation in decisions, all of which positively contribute to engagement and well-being via job resources and job crafting (Zeshan et al., 2025). Additionally, digital job resources like digital communication and support have been shown to increase digital engagement that, in turn, contributes to work leadership (Zia et al., 2025).

Empirical research from various domains has shown that engagement often acts as a link between resources (psychological well-being, organizational support, autonomy, etc.) and positive outcomes, thereby reinforcing the focal position of engagement as a link relating to the JD-R model (Koroglu & Ozmen, 2021; Kumar, 2023). Considering digital wellbeing as a technology-specified aspect of general wellbeing, accordingly, increased engagement with work with the help of organizational resources will likely increase the EDWB score for the banking and IT sectors.

H2: Job resources (JRs) have a positive relationship with employee digital wellbeing (EDWB).

H4a: Job Resources (JRs) positively relate to employee engagement.

H4b: There is a positive relationship between employee engagement and employee digital wellbeing (EDWB).

H4c: Employee engagement mediate the relationship between job resources (JRs) to employee digital wellbeing (EDWB).

The body of literature regarding the digital wellbeing of employees in the service sector of Pakistan is explained with the help of the Job Demands-Resources model, which proposes that job demands/resources are related to employee wellbeing via health impairment and motivational processes. In the context of the digital workplace, job demands such as techno-overload, connectivity and work-life intrusion require high cognitive and emotional strains for employees, leading to technostress, exhaustion and poor digital wellbeing among employees (Marsh et al., 2024; Wang, 2023). Research in the service sector of Pakistan revealed that high workload and work-related stress have a negative impact on the wellbeing of employees in the service sector (Supriyadi, 2025). According to the JD-R model, job resources such as social support, feedback and development opportunities are beneficial in managing job demands and promoting the wellbeing of employees. Research regarding the digital workplace revealed that job resources enhance the motivation of employees, which in turn reduces the negative impact of job demands on the wellbeing of employees in the service sector (Han, 2025; Zeshan et al., 2025).

Job Demands-Resources (JD-R) Theory

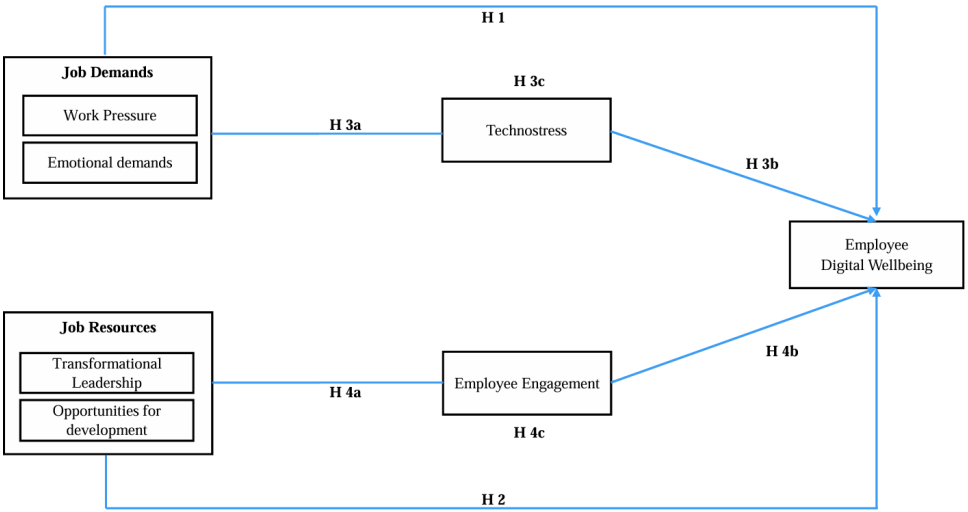
"Job Demands-Resources (JD-R) theory" argues, all jobs present unique risk factors in terms of job stress and well-being that are classified into JDs and JRs (Demerouti et al., 2001). JDs like amount of work, shorter deadlines and in the perspective of digital technologies, persistent connectivity with information overload are all forms of constant efforts expected to be made and involve physiological and psychological costs. Conversely, job resources like organizational support, autonomy, training opportunities, and access to technology are resources that aid in goal fulfillment, buffer job demands, and contribute to motivational routes (Bakker & Demerouti, 2007). According to the "JD-R theory", there are two fundamental processes: the health impairment, in which JDs cause strain and no wellbeing and the motivational route, which focuses on resources to boost well-being. This paper ambitions to add in the literature of "JD-R model"

in perspective of digitalized working atmosphere within the service industry in Pakistan.

Based on Job Demands-Resources (JD-R) Theory, theoretical framework, figure 1 describes how digital wellbeing among employees can be explained as a product of parallel processes. Job demands like work pressure and emotional demands lead to a health impairment process that results in technostress, which in turn affects the digital wellbeing of employees. On the other hand, transformational leadership and development opportunities as job resources lead to a motivational process that increases employee engagement, which positively affects the digital wellbeing of employees. Therefore, technostress can be described as a strain process of job demands, while employee engagement can be described as a motivational process of job resources that determine the digital wellbeing of employees in a technology-intensive work environment.

Figure 1

Theoretical Framework



The novelty of this study's concept is the dependent variable, i.e., employee digital wellbeing, as it has been less researched compared to employee wellbeing. Though employee wellbeing has been extensively researched in the context of Pakistan, research on employee digital wellbeing is still scarce. Moreover, this study is also novel as it will explore employee digital wellbeing with the help of transformational leadership and

development opportunities under a single umbrella, as no such study has been conducted so far on this subject. Also, as per our knowledge, research on employee digital wellbeing in the Pakistani service sector is still very limited, and this is also a novelty of this research.

Methodology

The study is underpinned by a quantitative study and project that is informed by positivism, which is a philosophy that believes that the world is objective and observable (Creswell & Creswell, 2017). For testing of the relationship, study employed a survey-based, correlational, and explanatory research methodology. In a bid to enhance the studys ability to establish causality and reduce common technique biases, time-lagged cross-sectional methodology were performed where data was collected using two waves (T1 and T2) one week apart. The study explains the explanatory and causative effects of the study variables, like "job demands and job resources" on the dependent study variables, i.e., "employees digital wellbeing" through the mediation of technostress & employee engagement in service sector of Pakistan.

The unit of analysis includes individual employees who work in digital-enabled service sector firms in Pakistan, specifically in the banking and IT sectors. In this regard, the service sector in Pakistan has witnessed a tremendous digital revolution, especially due to the implementation of online banking systems, mobile banking applications, fintech-based integrations, cloud-based technologies and customer service technologies. In this regard, employees have to rely on digital technologies to perform their day-to-day activities and operations. The primary responses were gathered through the medium of a self-administered questionnaire. The primary data was collected in two phases to enhance causality. At T1, information was collected regarding independent variables JDs and JRs, along with mediators technostress (TechS) and employee engagement (EmpEng). The primary data was collected for the dependent variable EDWB at T2, which was conducted after one week of T1. The minimum sample size was fixed at 378, which was based on population/sample size of 450 reactions (Hair et al., 2019). At T1, 220 responses were received out of 450, while 180 responses were received at T2. The responses were matched between T1 and T2, out of which 166 responses were used after removing some responses because of incomplete responses. The response rate was considered adequate for primary data collection. Studies in social

science survey research methods reveal that sample sizes of 150-200 and above are considered adequate for estimation in regression, factor and structural modeling, other certain assumptions and multivariate analysis (Menard, 2002; Tabachnick, 2019).

Measurement

To make certain validity and reliability, scales were adapted commencing previous approved scales documented in relevant literature. The questionnaire used to measure JDs, such as work pressure (Cronbachs alpha 0.81) and emotional demands (Cronbachs alpha 0.88), adapted from Bakker et al. (2003a) and Bakker et al. (2004). Job resources, including transformational leadership (Cronbachs alpha 0.93), taken by Carless et al. (2000), and opportunities for advancement (Cronbachs alpha 0.88), by Bakker et al. (2003b). The digital employee well-being (Cronbachs alpha 0.91), of Zheng et al. (2015). The Employee Engagement Scale (EES) include dimensions like cognitive (0.94 reliability), emotional (0.88 reliability) and behavioral (0.91 reliability) adapted by Shuck (2017). The Technostress scale (Cronbachs alpha 0.93), adopted from Raub (1981). All items are taken on a "seven-point Likert scale". Authors of these scales emphases their broader application and adaptability (Bakker et al., 2003a; Zheng et al., 2015). The composed information was coded then cleaned before being investigated using SPSS. Descriptive statistics were first used to obtain to check distributional nature of variables. Then, remaining test were performed to test hypotheses.

Results

The respondents were selected from the service sector in Pakistan through convenience-snowball sampling, and the initial filtering question was used to ensure only those who were actively working in the digital space were considered for the analysis. Total 166 useable responses were considered for examination with no missing data. The sample was largely dominated by males, who constituted 82.5% (n = 137), while females accounted for 17.5% (n = 29). Related to age composition of sample, most participants belonged to the 31-35 years (21.1%) and 36-40 years (18.7%) age groups, followed by 51-55 years (18.1%), 41-45 years (14.5%), 46-50 years (13.9%), and 26-30 years (12.7%), while only 1.2% belonged to the 20-25 years age group. In relation to the educational attainment of the participants, the overwhelming majority held a Master's degree (97.0%), with only 1.8%

holding MPhil/MS (18 years of education) and 1.2% holding a Bachelor's degree. In relation to work experience, more than half of the participants (56.0%) had 6-10 years of experience, 32.5% had more than 10 years of experience, 10.2% who had 1-5 years of experience, and only 1.2% who had less than one year of experience. In general, the sample was largely composed of well-educated and experienced professionals, and thus was suitable for the study of workplace behavioral constructs.

Measurement Model

Prior to hypothesis testing, the data were screened and cleaned using SPSS. Frequency analysis showed no missing values across all items (N = 166), therefore no imputation was required. The minimum value is 1 and maximum values is 7, confirming correct Likert scale responses and absence of data entry errors. Examination of standardized z-scores indicated no significant outliers. Furthermore, normality assessment through "skewness and kurtosis" values showed acceptable distribution of data. Hence, dataset was considered suitable for further multivariate analysis.

Descriptive Statistics

Descriptive statistics, Table 1 tell that respondents report moderate levels of Job Demands (M = 37.78; SD = 7.35), indicating employees experience observable workloads, intellectual pressures, as well as technology-driven demands in the services domain. In parallel, Job Resources revealed moderate levels (M = 32.20; SD = 6.87), indicating that employees seem to have access to certain resources in their work context, although perhaps not always strong.

Here, the mean for the Employee Digital Wellbeing scale is comparatively higher (M = 74.43, SD = 14.14), which implies that employees, on average, feel they are coping with their digital work environments reasonably well. At the same time, the emergence of technostress at a moderate level (M = 14.67, SD = 3.49) indicates that employees experience strain due to digital workload, continuous connectibility, and technology-induced pressure. Employee engagement is also moderate-to-high level (M = 43.11, SD = 8.78), which indicates the high levels of engagement in work by employees. The "skewness and kurtosis" of all variables have been observed surrounded by a standard range of 1, which reveals, data is almost normally distributed.

Table 1
Descriptive Statistics (N = 166)

	Min	Max	Mean	*SD*	Skewness	Kurtosis
Job Demands	20.00	57.00	37.783	7.35	.051	-.139
Job Resources	18.00	51.00	32.20	6.87	.252	-.294
Employee Digital Wellbeing	36.00	108.00	74.43	14.14	-.157	-.179
Technostress	7.00	27.00	14.67	3.49	.358	.408
Employee Engagement	23.00	76.00	43.11	8.78	.611	.938

Reliability

Table 2, shows that all variables have satisfactory to excellent internal consistency. Job Demands (α = .923), Job Resources (α = .921), and Employee Engagement (α = .923) have excellent reliability, means that the items are quantifying the same thing. Employee Digital Wellbeing (α = .950) has very high reliability, but the high value may indicate that the items are somewhat similar, which is acceptable in behavioral studies. Technostress (α = .788) has acceptable reliability, which is sufficient because the number of items is small (4). All values pertain to Cronbach's alpha are above recommended level of .70, the scales are reliable and can be used for further statistical analysis.

Table 2
Reliability Statistics

Variables	Cronbachs Alpha	Items
Job Demands	.923	10
Job Resources	.921	8
Employee Digital Wellbeing	.950	18
Technostress	.788	4
Employee Engagement	.923	12

Structural Model

Factor Analysis

As can be observed, the Component Matrix, Table 3, reveals the strength of the relationship of each variable with the two components. Component 1 has strong positive loadings with Job Resources (.686), Employee Digital

Wellbeing (.881), and Employee Engagement (.685), which indicate that Component 1 is a resource-motivation dimension because these three variables are conceptually related. Similarly, Component 2 has strong loadings with Job Demands (.700) and Technostress (.703), which indicate that Component 2 is a demand-strain dimension because these two variables are conceptually related. Relating the results with Job Demands-Resources Theory, the results clearly support the two major dimensions of the theory: Job Resources pathway (leading to employee engagement and wellbeing) Job Demands pathway (leading to employee strain and stress)

Table 3

Component Matrix-Factor Analysis

	Component	
	1	2
Job Demands		.700
Job Resources	.686	
Employee Digital Wellbeing	.881	
Technostress		.703
Employee Engagement	.685	

Mediation Model 1: Job Demands, Technostress and Employees Digital Wellbeing

Mediation, Table 4, performed using PROCESS Model 4 in PROCESS Macro for IBM SPSS. The outcomes discovered, job demands have positive outcome on technostress. Value pertains to effect size β was 0.2076, standard error was 0.0334, and t-value was 6.21, indicating that $p < .001$. Furthermore, 19.06% of the variance in technostress was described by job demands, as indicated by $R^2 = 0.1906$. The result advocates, personnel practice greater heights of technostress specially JDs are high. Additionally, as job demands and technostress were entered as predictors of employee digital wellbeing, they had a significant model, $R^2 = 0.2465$, indicating 24.65% of the variance in digital wellbeing. The sway of JDs on EDWB was noteworthy and negative "(β = -0.6920, *SE* = 0.1454, $t = -4.76$, $p < .001$)", and impact of technostress on digital well-being was momentous and negative (β = -0.8894, *SE* = 0.3059, $t = -2.91$, p = .004). Most importantly, the indirect effect of JDs to EDWB through technostress came significant (β = -0.1846, Boot *SE* = 0.0717), and the 95% confidence interval and it did not comprise zero, demonstrating the presence of indirect

effects. Direct effect of JDs on EDWB came significant even after controlling for the effect of technostress, it is a case of partial mediation. These findings thus offer substantial empirical support of health impairment of "JD-R model".

Table 4

Mediation Model 1: Direct and Indirect Effects of JDs (X) on EDWB (Y) through TechS (M).

	β	*p*	*SE*	*LLCI*	*ULCI*
Direct effect of X on Y	-.692	.0000	.1454	-.9792	-.4048
Indirect effect(s) of X on Y	-.185		.0713	-.3281	-.0484

Note. The Confidence Interval and Standard Error are based on the Bootstrap sample

Mediation Model 2: Job Resources, Employee Engagement and Employees Digital Wellbeing:

To examine the mediation effect, PROCESS Macro for IBM SPSS used. Table 5 revealed, the weight of JRs taking place employee engagement was strong with statistically significant (β = 0.7731, *SE* = 0.0794, *t* = 9.74, *p* < .001), accounting for 36.63% of "variance" in EmpEng (R^2 = 0.3663). This proofs availability related to more JRs significantly boosts level of employee engagement. Moreover, while including both JRs and employee engagement as forecasters of EDWB, the results were statistically significant (R^2 = 0.2440). Job resources was found to have a significant positive direct consequence on digital wellbeing (β = 0.6783, *SE* = 0.1760, *t* = 3.85, *p* = .0002), as was employee engagement, found significant positive consequence on digital wellbeing (β = 0.3528, *SE* = 0.1378, *t* = 2.56, **p** = .011). Most importantly, however, was the finding of significant indirect effect of JRs on EDWB with employee engagement (β = 0.2727, Boot *SE* = 0.1198), as confirmed by a 95% confidence interval which excludes zero. The direct effect of JDs on EDWB, however, is still significant after controlling for employee engagement, which means that this was a case of partial mediation. These results offer strong empirical evidence to proposed motivational route of "Job Demands-Resources Model".

Table 5

Mediation Model 2: Direct and Indirect Effects of JRs (X) on EDWB (Y) through EmpEng (M).

	β	*p*	*SE*	*LLCI*	*ULCI*
Direct effect of X on Y	.6783	.0002	.1760	.3307	1.0259
Indirect effect(s) of X on Y	2727		.1186	.0471	.5199

Note. The Confidence Interval and Standard Error are based on the Bootstrap sample

Correlations

Table 6, "Pearson correlation analysis" was used, and the results revealed significant and theoretically consistent relationships among the study's variables (N = 166). JDs were establishing to be negatively correlated through employee digital wellbeing (r = −.455, p < .001). The results suggest that as job demands increase, employee digital wellbeing tends to decrease. Moreover, job demands present positively correlated with technostress (r = .437, p < .001). The results suggest that as job demands increase, technostress also tends to increase.

Table 6

Correlations

	1	2	3	4	5
1. Job Demands	-				
2. Job Resources	.054	-			
3. Employee Digital Wellbeing	-.455***	.462***	-		
4. Technostress	.437***	.098	-.377***	-	
5. Employee Engagement	.041	.605***	.419***	.023	-

Then JRs show positively correlated with employee digital wellbeing (r = .462, p < .001) as well as employee engagement (r = .605, p < .001). The results suggest that as job resources increase, both employee engagement and digital wellbeing also tend to increase. Employee engagement was also positively related to digital wellbeing, r = .419, p < .001, whereas technostress shows negatively related to digital wellbeing, r = −.377, p < .001, thus emphasizing the negative influence of TechS on EDWB. Non-significant correlations were found for the following variables: JRs and JDs, r = .054, p = .487; job demands and employee engagement, r = .041, p = .604; job resources and technostress, r = .098, p = .210; and technostress

and employee engagement, r = .023, p = .773, thus indicating that these variables are distinct constructs. The obtained correlations support the hypothesized relationships and are align with the dual path of "JD-R Model" suggesting, JDs are related to technostress and digital wellbeing and JRs are related to employee engagement and digital wellbeing.

Regression

The multiple regression model, Table 7, used to inspect the joint effect of JDs and JRs on EDWB among employees was statistically noteworthy, as value of "multiple correlation coefficient", *R,* was .667, signifying a robust connection between IVs and outcome variable. "Multiple regression model" explained a substantial amount of variance to outcome variable, digital wellbeing among employees, as the value of R^2, the "coefficient of determination", was .445, representative that the joint effect of JDs and JRs explained 44.5% of the variance in digital wellbeing among the respondents. The value of adjusted R^2, .438, also confirms the significance of the multiple regression model, as it suggests that approximately 43.8% of the variance in digital wellbeing among the general population can be explained by the joint effect of JDs and JRs. "Standard error of the estimate", 10.60, suggests accuracy related to predictions. Thus, the current studys findings indicate that JDs and JRs, as combination, have a resilient explanatory influence on employee digital wellbeing, which is in line with the dual pathways described by the JDR Model.

Table 7

Model Summary-Regression Analysis

R	R^2	Adjusted R^2	Std. Error
.667	.445	.438	10.59860

The outcomes from the ANOVA test, Table 8, discovered that the multiple regression model, which predicts digital wellbeing among employees based on JDs and JRs, is statistically significant, $F(2, 163) = 65.43$, $p < .001$. This discovered, model delivered "significantly better fit rather than model" without any forecasters, thus supporting the claim, model explained "substantial proportion of variance" in digital wellbeing among employees. The large F-value revealed the strong "explanatory ability" of the predictors in model. This study supported the applicability of the "JDR", which revealed that the combination of JDs (risk factors) and

JRs (protective factors) significantly predicts digital wellbeing among employees.

Table 8

ANOVA-Regression Analysis

Model	Sum of Squares	*df*	Mean Square	*F*	*p*
Regression	14698.936	2	7349.468		
Residual	18309.835	163	112.330	65.427	.000
Total	33008.771	165			

The regression coefficients, Table 9, revealed that both JDs and JRs were significant forecasters of employees digital wellbeing. Job demands were found to be a significant negative predictor of digital wellbeing (B = -0.928, SE = 0.112, β = -0.482, t = -8.25, p < .001), signifying, increase in JDs is accompanying with substantial reduction in employees digital wellbeing. While, JRs were found to be a significant positive predictor of digital wellbeing (B = 1.005, SE = 0.120, β = 0.488, t = 8.36, p < .001). Moreover, standardized regression coefficients revealed that job resources (β = 0.488) had a slightly higher influence on digital wellbeing than the negative influence of job demands (β = -0.482), although both influences were of comparable magnitude. These findings were consistent with dual pathways of "JD-R model".

Table 9

Coefficients-Regression Analysis

Model	*B*	*SE*	β	*t*	*p*
(Constant)	77.127	5.650		13.652	.000
Job Demands	-.928	.112	-.482	-8.251	.000
Job Resources	1.005	.120	.488	8.360	.000

Discussion

Present research aims to discover the impact of job demands (JDs) and job resources (JRs) on employee digital well-being (EDWB) in service sector of Pakistan. The mediating variables in this research are technostress and employee engagement. The discoveries of the research fully supported the "assumptions of the JD-R model" regarding dual process (Bakker et al., 2023). Findings of the inquiry supported hypothesis H1, stating that JDs negatively impact employee digital well-being. Regression analysis discovered significant negative connection between job demands and

EDWB. The beta value was −0.482, with **p** < .001. This suggests job demands effect employee comfort (Li et al., 2025). In the Pakistani service sector, employees are often under workload pressure. The study also provided support for the positive role of job resources on wellbeing outcomes. Revering to the literature, as posited in H2, job resources positively affected employee digital wellbeing (β = 0.488, p < 0.001) (Cavicchioli et al., 2025).

Supporting H3a, JDs were positively connected to technostress (β = .208, p < .001). This implies that when employees experience increased digital workload they will experience increased technostress (Sevic et al., 2025). H3b was also supported, which found that technostress showed negative association with digital wellbeing (β = −.889, p = .004). Most notably, the mediation analysis revealed that H3c was correct: technostress indeed partly mediated between job demands and digital wellbeing (Indirect Effect: β = −0.185, 95% *CI* [-0.332, -0.053]). This implies with previous studies that job demands do not only directly affect wellbeing in a negative manner but also do so indirectly by influencing technostress (Raj, 2025). As expected by H4a, employee engagement was strongly predicted by job resources (β = .773, p < .001), as mentioned in literature (Kumar, 2023). Consistent with H4b, employee engagement positively influenced digital wellbeing (β = .353, p = .011). Employees who are engaged feel more enthusiastic able to manage more successfully with digital job requirements. Lastly, the mediation analysis supported H4c. This supports motivational process of the JDR (Zeshan et al., 2025).

In the context of developing nations like Pakistan, employees in the service industry frequently experience a highly demanding environment characterized by high work pressure and connectivity (Li et al., 2025). The results revealed that digital transformation does not directly influence wellbeing. All hypotheses were supported.

Conclusion

The present research intsended to explore the effect of Job Demands (JDs) and Job Resources (JRs) on Employee Digital Wellbeing (EDWB) within the service industry of Pakistan. The research was conducted by testing mediation models of JDs & JRs on EDWB, which is derived from "JD-R model". Results of research offered full support to fundamental supposition of "JD-R model", JDs are a strain-producing process, while JRs

are a motivational process. Findings of study showed, job demands have significant and negative impact on digital wellbeing, thus validating the negative impact of excessive workload, pressures, and digital overload on the psychological comfort of employees in technology-mediated work environments. While, job demands showed a positive association with technostress, while technostress showed negative association with digital wellbeing. This shows that technostress is a mediator of the impact of digital work pressures on employees, thus validating the mediation path proposed in the hypotheses. In contrast, JRs have strong positive association with digital wellbeing & employee engagement. In addition, employee engagement showed positive effect on EDWB and mediates the relationship between job resources and digital wellbeing. This study thus validated the dual-path model of the JD-R framework: the health impairment process (JDs → Technostress → EDWB) and the motivational process (JRs → Engagement → EDWB). The study concludes that the wellbeing of employees in the digital age is not necessarily dependent on technology but on the manner in which the workplace is designed to accommodate the use of technology.

Implications

The effect size findings suggest that the relationships within this model are not only statistically significant but also have practical importance. The implications of this research for higher education institutions and other similar knowledge-based work organizations suggest that addressing JDs and JRs is a significant strategic issue for organizations rather than an administrative task. For organizations that are able to manage their employees' workloads and reduce unnecessary digital interruptions, employees report better digital well-being and reduced strains. From the perspective of management, it implies that the HR departments should introduce interventions such as workload balancing policies, flexible scheduling, digital detox, and capacity-building programs. The findings lend support to the underlying expectations of Job Demands-Resources model in that they validate the idea that JDs and JRs operate through different psychological processes in their impact on employee digital wellbeing. The findings also contribute to theory in that they make available backing for idea that psychological processes underlie influence of job conditions on employee wellbeing.

Limitations and Future Recommendations

Despite the papers contribution, there are certain limitations. For instance, the paper was constructed on personnel's sample from service industry, particularly from the banking and IT industries of Pakistan with a small sample size. It would therefore be difficult to generalize the results of the paper to other industries. Moreover, the paper was based on two mediators, namely technostress and employee engagement, but other psychological or organizational factors were not taken into consideration. Future studies could be done by incorporating more mediators and moderators, such as organizational support or psychological safety to get more comprehensive view.

Author Contribution

Mahnoor Maqbool: conceptualization, data curation, formal analysis, investigation, methodology, software, writing – original draft, writing – review & editing. **Aqeel Ahmad:** project administration, supervision, validation, visualization.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

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