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Linking Technostress to Malaysian Public Servants' Well-being: A Moderated Model

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ABSTRACT

Employee well-being has become a strategic imperative in the digital era, particularly within the public sector, where technological demand and the need for human resources increasingly converge. However, emerging evidence indicates that Malaysian public servants are experiencing a lack of significant change in well-being. In addition, as Malaysia's ongoing digital transformation has significantly enhanced public sector efficiency, and as technology adoption advances, it also brings new challenges that may impact employee well-being. Challenges associated with digital transformation, such as technostress, are significant variables influencing employee well-being in the Malaysian public sector, particularly during ongoing digitalisation initiatives. This conceptual paper proposes a framework that links technostress to employee well-being, with technology self-efficacy serving as a personal resource that moderates this relationship by potentially buffering the harmful effects of technostress on well-being through enhanced employee confidence in managing technological demands. The conceptual model contributes to existing literature by integrating both technological and psychological aspects of employee experience, addressing a critical gap in public sector human resource management. The authors believe this is the first study of its kind to integrate technology self-efficacy in a moderated model involving the Malaysian public sector. These insights provide valuable guidance for policymakers and organisational leaders who aim to cultivate sustainable and resilient public service environments in Malaysia.

1. Introduction

In recent years, employee well-being (EWB) has gained significant attention worldwide in organisations, as it directly influences productivity, engagement, and organisational success [1]. EWB is a key concern for organisations and is defined by Katkar, Waghe, and Mundhe [2] as the overall quality of an employee's experience, encompassing overall mental, physical, emotional, and

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economic health. The growing digitalisation of work has further elevated the importance of EWB, as technological demands introduce new challenges that directly affect employees' psychological and work-related well-being.

The maintenance of EWB is seen as crucial for improving organisational productivity and achieving competitiveness, particularly during a period of digital transition. Although digital technology has improved efficiency and connectivity, it has created new work conditions that affect EWB [3]. Ren and Kim [4] identified that employees working in modern organisations handle too many organisational factors, including complex tasks, high-stress conditions, diminished employability, and job insecurity. Due to continuous incompatible interactions, they may perceive higher levels of anxiety, stress, and negative emotions, which eventually result in rising levels of low engagement, performance, and well-being. Aroles [5] also claimed that technological adoption has fundamentally reshaped how employees work, communicate, and balance their professional and personal lives. Therefore, EWB has been intensively studied recently due to the effect arising from digital transformation.

The digitalisation of government service delivery and the modernisation of public administration are becoming more crucial [6]. The Malaysian public sector, which has embraced extensive digital initiatives under the national digitalisation agenda, provides a relevant context for studying the dynamic interplay between technology use and EWB. As the well-being index of employees in the Malaysian public sector has consistently reported at a moderate level over several years [7], and the Malaysian public sector has also been increasingly challenged by the pressures of digital transformation, this study will examine technostress as one of the contributing factors that can affect EWB.

Technostress, a concept introduced by Brod [8], encompasses the stress individuals experience due to their inability to adapt to technological demands, including continuous connectivity, rapid software changes, and increased workloads. This new reality resulting from an increasingly accelerated digital transformation has been taking hold in all aspects of our personal and professional lives, reinforcing the information paradox [9]. On the one hand, it allows for increasing access to information, while on the other, it leads to technological stress, or technostress [9]. This phenomenon is particularly relevant in the public sector, as mentioned by Fleischer and Wanckel [10]. As the implementation of digital technologies and the transfer of services to electronic formats facilitate citizens' access to public services, who can file their requests at any time, from anywhere, it generates a natural increase in the demand for labour that overloads public servants [11]. In addition, they have to become more proficient in technology to familiarize themselves with new digital tools, which are increasingly complex, and learn how to use them effectively to meet the growing demands of citizens [12]. Above that, Bahri, Fauzi, and Ahmad [13] emphasized that the pursuit of efficiency through technology has played a significant role in accelerating technostress among employees in public sectors.

Despite the recognized importance of EWB, there is still a limited understanding of how digital demands shape well-being outcomes among public sector employees. The increased penetration of digital technologies into the lives of employees makes it important to analyse their well-being. Researchers like Galanxhi and Nah [14] and Yu *et al.,* [15] have emphasised the need to examine the domain of well-being especially in the context of employees as there are very limited findings in this sector. Thus, the well-being of employees in the ambit of digital transformation, such as technostress, is a research issue that needs to be addressed. Despite its importance, well-being has not been extensively studied in the literature to date, with only 4.7% of the studies looking directly at the impacts on it due to dark side effects [16].

Since public-sector employees increasingly face pressures from technology adoption, there is a need for adaptive functioning, which could help employees to experience a positive effect in negative

situations. Self-efficacy is the leverage that individuals depend on while dealing successfully with challenging situations. In this context, since the stress is triggered by ICTs, it is proposed that technology self-efficacy (TSE) will be the domain-specific self-efficacy. Along the same line, Pan [17] described TSE as the belief in one's ability to successfully perform a technologically sophisticated new task. Thus, the study proposes that TSE mitigates the detrimental effects of technostress, reflecting its function as a personal resource in managing digital demands by providing valuable insights especially in reducing stress and improving EWB. This study addresses that gap by proposing an integrative framework linking technostress, and TSE with EWB. The exploration of the roles of TSE can add a significant contribution to the existing literature and offer practical solutions to improve EWB in a digitalisation work environment. The results of this study may influence policy-making and strategic planning in human resource management, both in Malaysia and internationally, by emphasizing employees' competencies and capabilities in addressing technological issues.

2. Literature Review

2.1 Employee Well-Being

There are various definitions of EWB. According to Juchnowicz and Kinowska [18], analysing well-being from a global outlook involves aspects of one's life expectancy, economic status, and environmental influences. When analysing well-being from an individual standpoint, it includes a person's psychological measurement of their well-being, which refers to an individual's evaluation of their quality of life and work, influenced by their physical, social, and psychological quality [18].

EWB is widely recognized as a multidimensional construct that encompasses an individual's positive psychological functioning, job satisfaction, and overall life fulfilment. While earlier definitions focused narrowly on job satisfaction or the absence of stress, more recent conceptualisations adopt a holistic approach integrating both work and non-work domains. Following Zheng *et al.,* [19], this study conceptualises EWB as a higher-order construct comprising three interrelated dimensions: (1) life well-being refers to employees' satisfaction with their personal life and experiences outside of a work context; (2) workplace well-being focuses on specific aspects of the work environment, such as satisfaction with salary, colleagues, and the general work atmosphere; and (3) psychological well-being addresses internal psychological states, such as personal growth, purpose in life, and self-acceptance, within the professional context.

2.2 Technostress

Technostress was first conceptualised in the early 1980s as a modern disease of adaptation caused by the inability to cope or deal with new technologies in a healthy manner [8]. However, it was after 2000 when numerous studies investigated the technostress related to a variety of ICTs: corporate systems, mobile devices or applications, collaborative tools (email), etc. Technostress occurs when a person has a negative evaluation of their experience when carrying out tasks using technology at work [20] and represents a modern disease of adaptation that manifests as an effort to accept new technologies, but also as a dependency on technology [21]. Fischer and Riedl [22] mentioned that problems of this nature arise when individuals are unable to adapt to the most recent technological developments. Technostress is defined by Salanova, Llorens, and Ventura [23] as a negative psychological state associated with the use or the threat to use new technologies, which leads to anxiety, mental fatigue, scepticism, and a sense of ineffectiveness. According to Kim and Lee [24], technostress is stress caused by an abundance of information and the inability to process it. It is also psychological pressure caused by the difficulty of adapting to new information technology.

Additionally, Tu, Wang, and Shu [25] defined technostress as any negative impact on human psychology, attitudes, beliefs, and behaviours caused by technology. Similarly, Pansini *et al.,* [26] defined technostress as the negative effects of technology on employee behaviour, thoughts, and attitudes, which can lead to decreased job satisfaction, increased burnout, and decreased well-being in employees.

The concept of technostress was formed from five sub-factors and was used in the study. They are techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty [20]; [27]. These dimensions represent various ways in which technology can strain employees, from being overwhelmed by constant connectivity to feeling threatened by technological changes or job insecurity.

2.3 Technology Self-Efficacy

TSE, adapted from Bandura's self-efficacy theory, refers to an individual's confidence in their ability to effectively use and adapt to new technologies [18]. Similarly, Peterson [28] identified TSE as the degree to which people think they can effectively apply certain technologies to improve their performance. Employees with higher TSE are better able to cope with technological demands and perceive technology as an opportunity rather than a threat. Thus, TSE can act as a personal resource that buffers the negative impact of technostress on well-being. TSE can be understood as a resource that enables employees to manage digital demands efficiently. Individuals with strong technological confidence can better manage techno-overload and techno-complexity, thereby reduce strain and maintain well-being.

According to Bandura [29], self-efficacy is an individual's belief in their own abilities and skills to perform a given task. Afari [30] also claimed that it is a strong perception of personal effectiveness that is directly related to high levels of performance. This view is supported by Wray, Sharma, and Subban [31] who write that self-efficacy is a person's particular set of beliefs that determine how well one can execute a plan of action in prospective situations. In the current context of constant technological changes, self-efficacy is the most important personal characteristic to contribute to good work results involving the use of technology [32].

Over time, self-efficacy has been widely used to assess perceived competence in diverse contexts, particularly within the digital sphere [33]. Related constructs, such as computer self-efficacy, internet self-efficacy, ICT self-efficacy, and digital self-efficacy, evaluate individuals' confidence in their ability to interact effectively with digital technologies. This ability to utilize technology depends not only on a fixed set of digital skills but also on subjective beliefs about competence, as stated by Peiffer *et al.,* [34]. Malodia *et al.,* [35] also reported that those with higher digital confidence generally experience less anxiety and demonstrate greater persistence and proficiency in using digital technologies.

3. Hypotheses Development

3.1 Technostress and Employee Well-Being

Technostress is increasingly recognized as a significant job demand arising from the intensified use of digital technologies in the workplace. Estrada-Muñoz *et al.,* [36] affirmed that technostress is a 'dark side' of technology, a factor deteriorating well-being. The relationship between technostress and EWB has been extensively studied by Salo [37], indicating that high levels of technostress are associated with lower well-being. Wu, Chin, and Liu [38] also found similar results in their study on employees in smart hotels. They found that technostress negatively affects EWB. A recent study by

Viannie Clairie Jimmy *et al.,* [39] in a telecommunication company concluded that all technostress creators are negatively affected by EWB.

While the majority of previous studies found a negative relationship between technostress and EWB, the recent study by Goran and Mohammed [40] found a contrary result. The study indicated that there is a positive association between technostress and EWB. In fact, a more recent study by Mohd Nazri *et al.,* [41] found that only techno-uncertainty is related to EWB. The other technostress creators were not significantly related to EWB. Therefore, re-examining the influence of technostress on EWB is essential because the findings related to this relationship are still inconsistent. Thus, the following hypothesis is proposed.

H1: Technostress is negatively related to EWB among public sector employees in Malaysia.

3.2 Moderating Effect on the Technostress and EWB Relationship

A study by Ali, Nisar, and Nasir [42] indicated that TSE has a significant relationship with technostress and that it moderates the relationship between technostress and workload. Saleem *et al.,* [43] demonstrate that TSE reduces the perceived technostress through influencing thinking processes and biases towards technology use, and it regulates how people anticipate the use of technology. Yahşi and Hopcan [44] determined that high self-efficacy predicts low technostress. This is consistent with the study by Truța *et al.,* [45] that obtained TSE, which reduces perceived stress through positively manipulating individual perceptions towards technology use. Higher levels of TSE predispose people to use more apps and decrease the level of technostress [45].

Based on the previous literature, it is claimed that the efforts aimed at enhancing TSE may contribute to the improvement of technology-related user satisfaction. However, according to Ibrahim *et al.,* [46], although TSE significantly influenced the relationship between technostress and HRIS user satisfaction, the strength of the relationship was not very strong. These findings are similar to the results of Tarafdar *et al.,* [47], who found that TSE did not moderate the association between technostress and sales performance. Despite its relevance, there remains limited empirical evidence on how TSE moderates the relationship between technostress and EWB in the Malaysian public sector, creating an opportunity for this study to explore its full potential in enhancing EWB. Further, TSE has yet to be explored as a moderator in the relationships between technostress and EWB among public servants in Malaysia. Therefore, the following hypothesis is proposed:

H2: TSE moderates the relationship between technostress and EWB, such that the negative relationship is weaker when TSE is high.

4. Theoretical Foundation

4.1 Job Demands-Resources (JD-R) Theory

This study is primarily grounded in the Job Demands-Resources (JD-R) Theory initiated by Bakker and Demerouti [48,49], which explains employee well-being through the dynamic interaction between job demands, personal resources, and resulting strain or motivation. JD-R theory posits that all occupations are characterized by specific job demands-factors requiring sustained physical, emotional, or cognitive effort, and job or personal resources, which assist individuals in managing demands, promoting growth, and sustaining motivation. Central to JD-R is the assumption that well-being emerges from the dynamic interplay between job demands, job resources, and personal resources, whereby demands trigger a health-impairment process, while resources stimulate a

motivational process. This assumption is supported by Chen *et al.,* [50] and Hagemann *et al.,* [51] who support that on the one hand, the model posits that job demands impact employee health, while on the other hand, it suggests that job resources offer motivational potential and lead to increased work engagement. The present study is explicitly anchored in the health-impairment process, which asserts that sustained exposure to job demands exhausts employees' cognitive, emotional, and physical resources, leading to diminished well-being over time.

Within the digitalized Malaysian public sector environment, JD-R provides a robust foundation to explain how technology-driven work settings influence EWB. The rapid implementation of digital systems, online service platforms, and process automation has increased employees' exposure to technology-related pressures such as work overload, constant connectivity, technological complexity, and workflow disruptions, collectively conceptualised as technostress. These features correspond directly to the job demand component of JD-R, as they require sustained cognitive and emotional effort and are likely to tax employees' energy and resilience. In line with JD-R's health-impairment pathway, heightened technostress is expected to deplete psychological resources and ultimately reduce EWB.

Furthermore, TSE aligns with JD-R's classification of personal resources, defined as individuals' beliefs in their capacity to control and influence their work environment. TSE reflects an individual's confidence in effectively using and managing digital technologies. JD-R proposes that personal resources moderate the relationship between job demands and employee outcomes by influencing how individuals perceive and cope with challenges. Employees with higher TSE may interpret technology-related tasks as manageable rather than threatening, thereby reducing the strain associated with technostress. Likewise, strong technological confidence may help individuals optimize their work strategies, for example, by using digital tools more efficiently to manage workload and reduce spillover. Thus, JD-R provides a theoretically coherent rationale for positioning TSE as a moderating variable in the proposed model by buffering the health-impairment process.

By explicitly linking technostress and TSE to JD-R's core resource-based mechanisms, this study moves beyond a descriptive application of JD-R theory. Instead, it provides an analytical explanation of how technological conditions influence employee well-being through processes of resource depletion and protection, thereby enhancing the theoretical depth of the proposed model. This conceptual alignment underscores the applicability of JD-R in explaining how technostress diminishes well-being and how TSE buffers and strengthens this relationship in the context of digital transformation in the Malaysian public sector. JD-R uniquely integrates technostress as a job demand and TSE as a buffering personal resource while offering a clear mechanism linking these factors to EWB. This holistic explanatory power makes JD-R the most theoretically appropriate and methodologically defensible framework for examining well-being amidst digital transformation in the Malaysian public sector.

5. Conceptual Framework

Guided by the JD-R theory explained earlier, the conceptual framework positions technostress as a job demand and TSE as a personal resource that moderates the effects of these factors on employee well-being, as shown in Figure 1. The framework focuses on the health-impairment process, whereby sustained demands reduce well-being unless buffered by adequate personal resources.

In the model, technostress is conceptualised as a job demand that taxes employees' cognitive and emotional resources. As public sector employees adjust to intensified digitalisation, they face challenges such as technology overload, role ambiguity driven by technological change, and continued connectivity pressures. JD-R's health-impairment pathway posits that such demands

accelerate energy depletion and psychological strain, producing negative consequences for well-being. Thus, higher technostress is expected to reduce employees' overall well-being across psychological, workplace, and life domains, in which the significance of technostress was emphasized by examining it as an emerging job demand based on the JD-R model.

In contrast, TSE is introduced as a personal resource that shapes individuals' perceptions and responses to technology-driven work environments. Within JD-R, personal resources influence how employees evaluate demands and mobilize coping strategies. Employees with higher TSE are more confident in navigating digital tools, solving technology-related difficulties, and adapting to changes in work processes. This confidence is expected to buffer the negative effect of technostress on EWB by reducing feelings of threat, inefficacy, and frustration when interacting with technology. The JD-R framework allows for moderation effects, making it theoretically coherent with the proposed model where TSE moderates stress and balance pathways.

Collectively, the proposed framework depicts a balanced, theoretically consistent model in which the effects of digital workplace pressures (technostress) on EWB are conditioned by individuals' technological confidence. JD-R offers a coherent lens for interpreting these interactions, illustrating how demands and resources interact in the context of digital transformation within Malaysian public sector organisations. By integrating EWB as a multidimensional outcome that encompasses psychological, workplace, and life well-being, the framework captures the holistic nature of employee functioning and the realities of modern public service work.

This conceptualisation provides a comprehensive perspective on how digitalisation affects employees and highlights the critical need for strengthening personal and organisational resources to preserve well-being. The interplay between technostress and TSE emphasizes that EWB is not merely the absence of strain but the result of a balanced system of demands and resources. The proposed framework therefore guides empirical examination and informs strategic interventions aimed at safeguarding well-being in digitally evolving public sector settings.

The relationship among the three variables remains ambiguous, and it appears that literature is scarce on the subject. On the other hand, this research provides new empirical and theoretical insights into the nature of this link. As a result, the researcher decides to undertake this study because there is a gap in the existing research. There is currently a lack of data and research that examines and explains how technostress affects EWB. Technostress in the public sector context and public servants' well-being are all topics that have received little research attention. Moreover, the researcher was intrigued by the direct effects of technostress on the well-being of public servants in Malaysia, both of which are important to their professional development. This study also aims to extend the JD-R model and establish it as a systematic and theoretical framework for focusing on digitalisation in the work context.

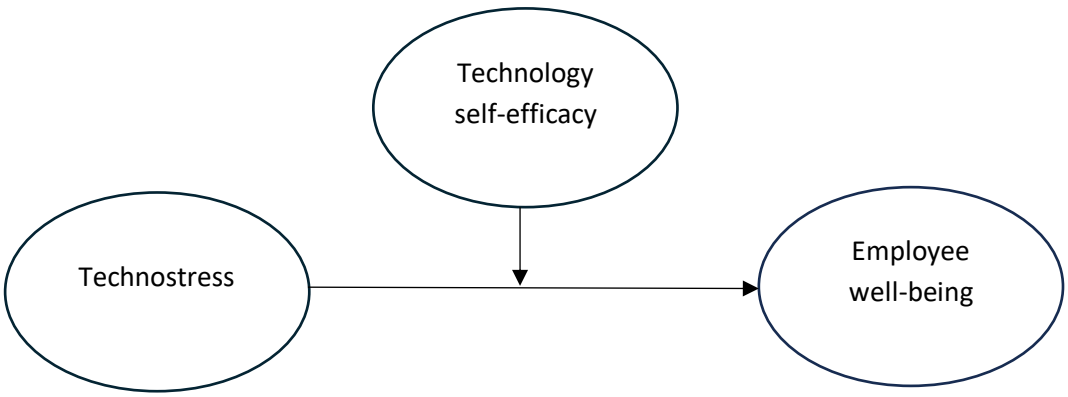

Fig. 1. The conceptual framework

6. Significance of the Study

The present study provides important theoretical and practical contributions by conceptualising the effect of technostress on EWB within the Malaysian public sector while highlighting TSE as a key moderating mechanism. As Malaysia accelerates its public-sector digitalisation agenda, understanding how technological demands interact with personal and organisational resources becomes essential. Despite these shifts, limited conceptual models have explored how digital pressures simultaneously shape well-being in the government workforce. This study addresses this gap through a theoretically grounded and contextually relevant framework.

6.1 Theoretical Contributions

First, this study significantly extends the JD-R Theory by integrating technostress as a job demand influencing well-being. While JD-R research has widely examined traditional stressors, previous scholarship pays inadequate attention to technology-driven stress in public-sector digital transformation. By positioning technostress as an antecedent of well-being, the model advances JD-R's ability to explain how digitalisation alters employees' cognitive, emotional, and relational experiences. This study contributes to the growing literature on technostress by situating it firmly within the health-impairment process of JD-R theory.

Second, the study advances the understanding of TSE by theorizing its moderating role. The model clarifies how employees' belief in their technological capability can buffer the detrimental effects of technostress on well-being by facilitating effective digital and emotional self-regulation. Although TSE has been widely examined as a predictor of technology adoption, its use as a moderator influencing well-being outcomes among public servants remains underexplored. This conceptualisation provides a novel theoretical lens that bridges digital competence and well-being research.

Third, this study contributes to employee well-being theory by operationalizing EWB as a multidimensional construct that spans life, workplace, and psychological domains, following Zheng *et al*. In contrast to dominant approaches that isolate well-being within the work domain, this study demonstrates that employees' responses to technological demands cannot be fully understood without accounting for their broader psychological and life-related outcomes. This approach not only enhances construct validity but also aligns well-being measurement with the increasingly blurred boundaries between work and non-work domains, thereby offering a more theoretically robust foundation for future research on digital work environments.

6.2 Practical Contributions

This study offers several context-specific practical contributions for enhancing employee well-being in the Malaysian public sector, particularly in light of ongoing digital transformation initiatives. First, the findings highlight technostress as a significant job demand, suggesting that public sector organisations should move beyond general stress management approaches and instead implement technology-specific intervention strategies. For example, ministries and government agencies can integrate technostress risk assessments into existing digitalisation initiatives under the Public Sector Digitalisation Strategic Plan, ensuring that workload, system complexity, and after-hours digital expectations are addressed during system implementation rather than after problems emerge.

Second, the moderating role of TSE suggests that improving employees' digital confidence can significantly buffer the negative effects of technostress. Rather than one-off training sessions, public sector agencies can embed continuous, role-specific digital capability development within existing

training institutions such as the National Institute of Public Administration (INTAN). Peer mentoring systems, digital champions within departments, and task-based learning modules can further strengthen employees' ability to cope with technological demands.

Finally, the findings provide actionable insights for public sector human resource management and policymakers. Human resource divisions can incorporate digital competence measures into regular employee well-being assessments, enabling early identification of at-risk groups. At the policy level, the study supports the development of evidence-based digital well-being guidelines that align technological advancement with employee sustainability, reinforcing the government's broader objective of creating a resilient and high-performing public service. By translating theoretical insights into institutionally grounded actions, this study bridges the gap between employee well-being theory and public sector digitalisation practice in Malaysia.

7. Limitations of the Study

Despite its theoretical contributions, this study has several limitations that should be acknowledged. First, the proposed model is conceptual in nature and has not been empirically tested. As such, the relationships among technostress, TSE, and EWB are theoretically grounded but remain subject to empirical validation. While this approach is appropriate for theory development, it limits the ability to draw causal inferences or assess the strength of the proposed relationships.

Second, the study relies on established constructs and theoretical frameworks, particularly the JD-R theory. Although this enhances theoretical robustness, it may constrain the exploration of alternative explanatory mechanisms, such as social exchange or institutional perspectives, that could also account for employee well-being in digital work contexts.

Third, the conceptual focus on the Malaysian public sector may limit the generalizability of the proposed model to other organisational or cultural settings. Public sector work is shaped by unique structural features, such as bureaucratic processes, hierarchical decision-making, and service-oriented performance demands, which may influence how technostress is experienced.

8. Directions for Future Research

Building on the proposed conceptual model, several avenues for future research are recommended. First, future studies should empirically test the proposed relationships using quantitative research designs. Survey-based studies employing structural equation modelling (SEM or SEM Amos) would be particularly suitable for examining the multidimensional nature of EWB and the moderating role of TSE.

Second, future research could adopt longitudinal designs to examine the dynamic effects of technostress on employee well-being over time. Such designs would be especially valuable for testing propositions derived from the health-impairment process of JD-R theory.

Third, qualitative or mixed-methods studies may provide deeper insights into how public sector employees experience technostress in digitally intensive environments. In-depth interviews or focus groups could uncover contextual factors, such as organisational culture and leadership practices, that shape employees' coping strategies and perceptions of well-being.

Fourth, future studies could extend the model by examining alternative empirical contexts, including private sector organisations, hybrid or remote work settings, and cross-cultural samples. Comparative studies across sectors or countries would help determine the boundary conditions of the proposed model and enhance its generalizability.

Finally, future research may explore additional personal and organisational resources, such as digital leadership, perceived organisational support, or flexible work policies, to further refine JD-R-based explanations of EWB in the context of digital transformation.

9. Conclusion

The rapid digital transformation within Malaysia's public sector has intensified attention toward employees' ability to maintain well-being while adapting to evolving technological environments. By offering an integrative framework that investigates the effects of technostress on EWB, with TSE as a moderating variable, this conceptual study adds to this conversation. The JD-R Theory provides theoretical robustness by explaining how technostress interacts with personal resources to influence well-being, offering a more holistic understanding of well-being adaptation in technology-driven work environments. By combining JD-R theory with a multidimensional view of well-being and contextualizing the model within the Malaysian public sector, the study offers a foundation for future empirical research and practical intervention. As public organisations continue to embrace digital technologies, ensuring employee well-being remains central to sustainable and effective public service delivery.

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