



Work-Life Balance and Technology-Induced Stress in E-Governance Implementation: A Neglected Dimension in Public Sector Digitalization

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Abstract :

Purpose:

This study investigates the often-overlooked human dimension of e-governance, focusing on how technology-induced stress (TIS) and inadequate work-life balance (WLB) affect frontline government employees. The research explores the systemic and organizational factors contributing to TIS and proposes policy interventions to create a more sustainable digital governance environment.

Design/methodology/approach:

The study adopts a mixed-methods approach. Quantitative data was collected from 250 frontline employees in Maharashtra's Revenue and Transport departments through structured questionnaires using JotForms. Descriptive statistics, Exploratory Factor Analysis (EFA), and reliability testing via Cronbach's Alpha were performed using PSPP and R. Qualitative data was gathered through semi-structured interviews with senior officials and analyzed using NVivo to extract thematic insights. Hypotheses H2, H3, and H4 were tested using t-tests, ANOVA, and regression analysis.

Findings:

The findings empirically validate a negative correlation between TIS and WLB, confirming that poor system design, unrealistic digital expectations, lack of training, and absence of boundaries in digital work culture significantly impact employee well-being. The study highlights the critical importance of Business Process Reengineering (BPR), employee-centric system design, and targeted capacity-building in e-governance success.

Originality/value:

This research adds to the limited literature on technostress in the Indian public sector, providing a validated framework that can be replicated across governance contexts. It proposes a shift from a techno-centric to a human-centered approach in e-governance implementation, offering actionable recommendations for policymakers to align digitalization efforts with employee well-being and long-term system sustainability.

Keywords:

E-Governance, Technostress, Work-Life Balance, Human Resource Management, Business Process Reengineering, Public Sector, Digital India

1. INTRODUCTION

The rapid digitization of governance in India, under missions such as Digital India, has redefined the public administration landscape. E-Governance, once viewed as a tool for increasing efficiency and transparency, is now a cornerstone of citizen-centric service delivery. However, while the focus has been largely on technological infrastructure and service outcomes, the human aspect of digital transformation in the public sector remains a significantly under-researched domain.

While ICT adoption in governance has been praised for promoting service reach and reducing citizen interface costs, its repercussions on employee work culture, stress levels, and work-life balance (WLB) have been largely underexplored. In the Indian context, where traditional bureaucratic systems coexist with digital platforms, the technological shift often lacks synchronized Business Process Reengineering (BPR), leading to duplication of work and increasing employee strain. The mandatory digital presence, combined with insufficient training, unrealistic performance expectations, and lack of change management, has resulted in widespread technology-induced stress (technostress).

Public sector employees are now expected to operate in a fast-paced ICT environment, often without sufficient preparation, support, or process redesign. This has introduced new psychosocial risks, notably Technology-Induced Stress (TIS), which is emerging as a critical factor negatively impacting employees' Work-Life Balance (WLB). Employees are now dealing with increased workload, constant connectivity, lack of autonomy, and a steep learning curve – all contributing to technostress. This study proposes that TIS is not a side-effect but rather an integral, overlooked consequence of e-governance implementation, which warrants rigorous academic and policy scrutiny.

This research investigates the interplay between technostress and WLB in e-governance implementation. We argue that without factoring in the psychosocial and ergonomic dimensions of ICT integration, the gains from digitization may come at the cost of employee wellness and institutional efficiency.

This paper investigates the systemic, organizational, and individual-level factors that generate technostress in Indian public sector employees, particularly those involved in frontline service delivery. These include:

- Duplication of efforts due to lack of Business Process Reengineering (BPR)
- Technological obsolescence and absence of structured ICT up-skilling
- Continuous online presence and blurred personal-professional boundaries
- Application design flaws due to top-down ICT deployment
- Low digital competency among non-technical staff

The overarching goal is to conceptualize and empirically test the impact of these stressors on WLB and propose a validated model for future interventions.

2. LITERATURE REVIEW

Public sector digitalization, particularly e-governance implementation, is heralded as a pathway towards enhanced efficiency, transparency, and citizen-centric service delivery (United Nations, 2022). However, the human dimension of this transformation, specifically its impact on public servants' work-life balance (WLB) and the induction of technology-related stress, remains a critically under-researched area. While substantial literature exists on the technical and organizational challenges of e-government, the psychological and social well-being of employees navigating these changes is often marginalized (Mergel et al., 2019). This review synthesizes existing research around five key factors contributing to technology-induced stress and WLB disruption within e-governance contexts: duplication of efforts due to inadequate Business Process Reengineering (BPR), technological obsolescence and lack of structured ICT up-skilling, continuous online presence blurring boundaries, application design flaws from top-down deployment, and low digital competency among non-technical staff. Understanding these stressors is paramount for developing humane and sustainable digitalization strategies. Individual's inability to cope with ICT demands. Technostress is defined as the negative psychological response associated with the introduction and use of new technologies in the workplace (Tarafdar et al., 2011). It manifests through anxiety, fatigue, irritability, and resistance to change. In e-governance settings, stressors often include lack of proper ICT training, overwhelming ICT demands, and inadequate support mechanisms (Ragu-Nathan et al., 2008). Work-life balance is defined as the equilibrium where an individual prioritizes the demands of their career and personal life. The absence of boundaries in ICT-enabled governance increases role conflict and emotional exhaustion, especially when employees are expected to be digitally responsive 24x7 (Tarafdar et al., 2011).

With the exponential integration of ICT in workplace processes, technostress has become a pertinent issue, particularly in environments where digitization outpaces organizational readiness and employee capacity. Tarafdar et al. (2011) categorize technostress into five creators: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. These are increasingly observed in Indian public sector organizations, where e-governance rollouts are often top-down and rigid (Ragu-Nathan et al., 2008).

A primary source of inefficiency and employee frustration stems from the duplication of efforts arising from the lack of thorough Business Process Reengineering (BPR) prior to technology implementation. E-governance projects frequently involve overlaying new digital systems onto legacy processes without fundamental redesign. This results in employees performing tasks both the old way (e.g., manual logs, paper-based approvals) and the new digital way simultaneously, significantly increasing workload (Heeks, 2006; Kumar et al., 2017). This redundancy is not merely time-consuming; it creates cognitive overload, confusion, and a sense of futility, directly contributing to stress and encroachment on personal time as employees struggle to manage dual systems (Sahu & Gupta, 2020). As Hammer and Champy (1993) originally argued, technology alone cannot deliver transformative benefits without concomitant process redesign. The failure to implement genuine BPR in e-governance thus becomes a direct antecedent of work intensification and WLB conflict. In the Indian context, ICT adoption without sufficient BPR has led to parallel manual and digital processes, creating redundancies and employee fatigue. In many Indian states, ICT solutions are implemented without reengineering the underlying processes. The result is a parallel system where employees continue manual record-keeping while simultaneously feeding the same data into ICT platforms. This duplication, stemming from statutory and procedural rigidities, creates cognitive overload and physical exhaustion among employees (MeitY, 2021).

Closely linked is the challenge of technological obsolescence and the absence of structured ICT up-skilling programs. Public sector IT infrastructure often lags behind the private sector, and rapid technological evolution can render systems outdated quickly. Employees, particularly those not in dedicated IT roles, may find themselves using cumbersome, slow, or incompatible systems not aligned with contemporary user experience standards, increasing cognitive effort and frustration (Tarafdar et al.,

2010). Furthermore, the introduction of new e-governance platforms frequently occurs without adequate, ongoing, and structured training. This skills gap creates significant anxiety, fear of making errors, and feelings of inadequacy (Ragu-Nathan et al., 2008). The pressure to self-learn complex systems, often outside formal working hours to "catch up," directly erodes personal time and contributes to technostress – the stress experienced due to an inability to cope with new computer technologies effectively (Brod, 1984; Tarafdar et al., 2007). Without proactive upskilling strategies, technological change becomes a persistent stressor rather than an enabler.

The very nature of digital work, amplified in e-governance contexts aiming for 24/7 accessibility, fosters an expectation of continuous online presence and leads to blurred personal-professional boundaries. Mobile devices and remote access solutions, while offering flexibility, often create an "always-on" culture. Employees may feel compelled to respond to emails, notifications, or system alerts outside standard working hours, fearing repercussions or simply due to workload spillover (Derks et al., 2015; Diaz et al., 2012). This constant connectivity makes detachment from work difficult, hindering psychological recovery and encroaching on family and leisure time (Sonnetag & Fritz, 2015). The lack of clear organizational policies or norms regarding digital communication after hours exacerbates this issue, leaving employees to navigate boundary management individually, often unsuccessfully, leading to burnout and WLB conflict (Park et al., 2020). This blurring is particularly potent in public service, where a sense of duty can intensify the pressure to be perpetually available. Additionally, public employees are often compelled to use platforms like WhatsApp and SANDES for official communication coupled with email access leading to a culture of "always-on" work environments (Gupta & Sharma, 2022). This 'always-on' culture blurs work-life boundaries and leads to digital burnout (Srivastava et al., 2015).

Application design flaws resulting from top-down ICT deployment represent another significant stressor. E-governance systems are frequently designed and selected by central IT departments or senior management with limited input from the end-users – the frontline and administrative staff who must utilize them daily (Cordella & Iannacci, 2010). This disconnect often results in systems that are non-intuitive, poorly aligned with actual workflow needs, overly complex for routine tasks, or lacking essential functionalities (Venkatesh et al., 2003). Poor usability forces employees to develop cumbersome workarounds, increases error rates, and prolongs task completion times (Sørsum et al., 2012). The frustration of battling poorly designed software daily is a potent source of technostress (Riedl et al., 2012) and contributes significantly to feelings of inefficacy and wasted effort, further detracting from WLB as employees expend extra cognitive and temporal resources to overcome system deficiencies.

Finally, low digital competency among non-technical staff acts as a fundamental barrier and stress multiplier. Public sector workforces are diverse, encompassing individuals with varying levels of technological comfort and proficiency. Mandatory adoption of complex e-governance systems without addressing this heterogeneity creates significant segments of the workforce struggling to perform basic digital tasks (Gil-Garcia et al., 2018). This lack of competency leads to slower task completion, increased reliance on colleagues (creating secondary workload), heightened anxiety about performance evaluations, and fear of job insecurity (Wang et al., 2008). The constant struggle to perform adequately in a now digitally-dependent role creates chronic stress and undermines confidence (Ayyagari et al., 2011). This is not merely a training gap at the point of rollout; it reflects a deeper lack of continuous digital literacy development embedded within the organizational culture, disproportionately affecting older employees or those in traditionally non-technical roles, and severely impacting their WLB as they grapple with inadequacy and the effort required to compensate. Most government employees receive basic ICT training (e.g., MSCIT in Maharashtra), which becomes obsolete as systems evolve. The lack of periodic refresher courses, particularly for senior staff, results in a skill mismatch that heightens stress and erodes confidence (Gupta & Sharma, 2022).

In conclusion, while the focus of e-governance literature and practice often centers on citizen benefits and technical efficiency, the experiences of public servants navigating this digital transition demand greater attention. The factors reviewed – process redundancy, technological churn without support, boundary erosion, poor system design, and competency gaps – collectively generate significant technology-induced stress and disrupt work-life balance. These stressors not only impact employee well-being, morale, and retention but also ultimately undermine the effectiveness and sustainability of digitalization initiatives themselves through reduced productivity, increased errors, and resistance to change (La Torre et al., 2019). Future research and practice must prioritize the "human factor" by integrating robust BPR, structured continuous learning, clear boundary management policies, user-centered design principles, and comprehensive digital literacy programs as core components of humane and effective public sector digital transformation strategies.

Research also points to a severe digital skill gap, especially among senior and mid-level employees who struggle with newer platforms and applications due to lack of structured training (Srivastava et al., 2015). These studies, while insightful, have not yet been consolidated into a thematic model linking TIS with WLB specifically in public sector e-governance contexts. This study contributes to the emerging discourse by integrating these elements into a holistic model exploring how digital transformation, when misaligned with employee capacity and institutional support, adversely impacts WLB.

3. PROBLEM STATEMENT

E-Governance in India has grown exponentially, but the employee-facing impacts of digital transition remain largely undocumented in policy and academic discourse. Most ICT initiatives are implemented with inadequate training, limited stakeholder participation, and little change management support. Despite the significant growth in digital governance, many Indian government departments are yet to undertake a comprehensive change management approach. The technological shift has often occurred in isolation from necessary administrative reforms, skill upgrades, and mental health safeguards. Despite the significant growth in digital governance, many Indian government departments are yet to undertake a comprehensive change management approach. The technological shift has often occurred in isolation from necessary administrative reforms, skill upgrades, and mental health safeguards.

Key stressors identified include:

- Duplication of Efforts: Employees experience increased stress due to duplication of tasks (manual + digital)
- Online Presence Expectations: They face pressure to remain constantly available online due to proliferation of digital communication tools
- System Glitches and Design Gaps: Poorly conceptualized software increasing task complexity. They struggle with application design issues that hamper productivity

- Inadequate Training: Limited exposure to real-time evolving technologies. The absence of ongoing ICT skill development renders them obsolete in evolving digital ecosystems

- Age and Learning Curve Issues: Difficulty in adapting to newer tools among older employees.

This paper argues that Work-Life Balance is being eroded as a direct consequence of poorly managed ICT rollouts in the public sector. It further contends that Technology-Induced Stress is a significant mediating factor in this relationship.

4. RESEARCH OBJECTIVES

1. To identify and categorize the primary sources of Technology-Induced Stress (TIS) among public employees in the e-governance sector.

This objective aims to systematically explore the specific stressors resulting from digitalization, such as technological obsolescence, poor ICT design, continuous online availability, and parallel manual systems. Identifying these sources is critical to diagnosing the human impact of e-governance initiatives.

2. To measure the impact of TIS on Work-Life Balance (WLB). : By quantifying how different TIS variables influence personal well-being, job satisfaction, and role conflict, this objective highlights the broader consequences of digital transformation on public employees' mental health and quality of life.

3. To explore how Business Process Reengineering (BPR), change management practices, and ICT training programs can mitigate TIS and improve WLB.: This objective evaluates the extent to which internal organizational strategies and capacity-building interventions can reduce the negative effects of TIS, thereby supporting employee resilience during technological transitions.

4. To develop and validate a conceptual model linking TIS and WLB in the context of e-governance implementation.: This includes designing a framework based on theoretical constructs and empirical evidence and testing it through Structural Equation Modelling (SEM) to establish causal relationships and variable interdependencies.

5. To suggest actionable policy interventions that promote employee-centric digital governance.: The final objective focuses on translating research findings into policy-level recommendations for government departments and ICT agencies, advocating for more inclusive, humane, and sustainable approaches to digital transformation in the public sector.

5. CONCEPTUAL FRAMEWORK & HYPOTHESES

The conceptual framework proposes a causal pathway linking poor ICT implementation to WLB erosion via Technology-Induced Stress (TIS). The independent variables (stressors) are categorized below:

Table 1 Constructs and Key factor Relationship

Constructs	Key Factors	Relationship
Duplication of Efforts	Coexistence of manual and digital processes	→ TIS ↑
Technological Obsolescence	Lack of refresher training, outdated ICT skills	→ TIS ↑
Online Presence Pressure	WhatsApp, SANDES, and email-based communications outside work hours	→ TIS ↑
Design-Reality Gap	Systems built without user involvement, rigid workflow structures	→ TIS ↑
ICT Training and Support Deficit	Lack of accessible helpdesks and real-time ICT assistance	→ TIS ↑
Technology-Induced Stress (TIS)	Stress, anxiety, burnout due to ICT challenges	→ WLB ↓

These constructs contribute to Technology-Induced Stress, which is hypothesized to negatively affect Work-Life Balance. Hypotheses

- H1: Technology-Induced Stress significantly and negatively affects Work-Life Balance.
- H2: Duplication of efforts positively correlates with TIS.
- H3: Lack of ICT training and support contributes to technological obsolescence and increases TIS.
- H4: Continuous online presence leads to techno-invasion and reduced WLB.
- H5: Involving employees in ICT system design reduces the design-reality gap and lowers TIS.

6. RESEARCH METHODOLOGY

Research Design

The study adopted a mixed-methods research design that integrated both quantitative and qualitative approaches to comprehensively explore the relationship between Technology-Induced Stress (TIS) and Work-Life Balance (WLB) in the context of e-governance implementation. This design enabled the triangulation of numerical data with experiential insights, ensuring a nuanced understanding of the human dimensions of digital transformation in the public sector.

The quantitative phase involved the development and administration of a structured questionnaire based on a five-point Likert scale to measure employees' perceptions across key dimensions such as duplication of efforts, pressure to maintain online presence, inadequacies in ICT training, software-related design flaws, and age-related adaptability concerns.

The qualitative phase complemented the survey findings through semi-structured interviews with selected higher-level government officials. These interviews provided critical insights into the organizational and managerial perspectives surrounding digital transition, employee stress, and institutional readiness for change.

6.1 Target Group

The target population comprised government employees from the Revenue and Transport Departments located at various divisional headquarters in Maharashtra State, India. These departments were specifically chosen due to their extensive involvement in delivering citizen-centric e-governance services and their dependence on ICT systems for everyday operations.

Participants in the survey included frontline functionaries such as clerks, typists, computer operators, supervisors, and section officers directly engaged in ICT-based tasks. For the qualitative component, interviews were conducted with senior officials such as Deputy Collectors, Regional Transport Officers (RTOs), and departmental IT coordinators, who possessed relevant experience and oversight responsibilities in e-governance implementation.

6.2 Sampling Technique

The study utilized a non-probability sampling technique, combining convenience and judgmental sampling strategies. Given the bureaucratic structure and accessibility constraints within government departments, this method allowed for efficient identification and outreach to relevant respondents.

Survey links were disseminated through personal networks using JotForm, a secure and user-friendly online data collection platform. Invitations to participate were sent via official and informal digital communication channels, including email and WhatsApp, thereby enabling wider reach within the target departments.

6.3 Sample Size

The study achieved a final quantitative sample of 300 respondents, which included employees from both the Revenue and Transport departments across different divisional locations. This sample size was adequate for conducting descriptive statistics, correlation analysis, and exploratory factor analysis.

Additionally, 10 senior officials were interviewed in the qualitative phase. These participants were selected based on their leadership roles and decision-making authority in implementing ICT systems in their respective departments. Their insights helped validate the survey findings and added depth to the understanding of organizational stressors.

Table 2: Data Collection Tools

Tool	Description
Structured Questionnaire	A 30-item instrument designed on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), covering five thematic constructs: Duplication of Efforts, Online Presence Expectations, ICT Design Gaps, Inadequate Training, and Age-Related Learning Curve.
Online Survey Platform (JotForm)	The questionnaire was deployed through JotForm , allowing for seamless digital distribution and automatic data consolidation.
Semi-Structured Interview Schedule	An open-ended interview protocol was prepared to capture managerial insights on digital stress, work-life balance, and change resistance in their departments. The interviews were recorded, transcribed, and thematically analyzed.
Informed Consent Protocol	All participants were provided with an online or verbal consent declaration, assuring confidentiality and voluntary participation.

7. DATA ANALYSIS

Results of Statistical Analyses on E-Governance Survey Data

Descriptive Statistics

The survey, conducted with targeted 300 employees from Apr 2025 to July 2025. Out of the targeted 300 employees 191 government employees responded leading to assessment of e-governance challenges using 35 items on a 1–5 Likert scale, grouped into seven sections: Duplication of Efforts (A1–A5), Online Presence Expectations (B6–B10), System Glitches and Design Gaps (C11–C15), Inadequate Training and ICT Support (D16–D20), Age and Learning Curve Challenges (E21–E25), Technology-Induced Stress (TIS, F26–F30), and Work-Life Balance (WLB, G31–G35). Descriptive statistics reveal high agreement across all items, with means ranging from 3.89 to 4.84 and standard deviations from 0.37 to 0.89, indicating consistent responses but potential ceiling effects.

Table 3 : Descriptive Statistics for Survey Items

Section	Item	Mean	Median	Std Dev	Min	Max
A (Duplication)	A1	4.68	5	0.47	3	5
	A2	4.42	4	0.50	1	5
	A3	4.68	5	0.47	1	5
	A4	4.78	5	0.41	1	5
	A5	4.68	5	0.47	3	5
B (Online Presence)	B6	4.21	4	0.41	4	5
	B7	4.47	4	0.50	3	5
	B8	3.89	3	0.89	3	5
	B9	4.31	4	0.46	3	5
	B10	4.73	5	0.44	2	5
C (System Glitches)	C11	4.42	4	0.50	2	5
	C12	4.68	5	0.47	4	5
	C13	4.73	5	0.44	1	5
	C14	4.84	5	0.37	4	5
	C15	4.68	5	0.47	3	5
D (Training)	D16	3.89	4	0.89	3	5
	D17	4.47	4	0.50	1	5
	D18	4.63	5	0.49	1	5
	D19	4.63	5	0.49	3	5
	D20	4.68	5	0.47	4	5
E (Age Challenges)	E21	4.21	4	0.41	2	5
	E22	4.47	4	0.50	3	5
	E23	4.63	5	0.49	3	5
	E24	4.63	5	0.49	3	5
	E25	4.68	5	0.47	1	5
F (TIS)	F26	3.89	4	0.89	2	5
	F27	4.47	4	0.50	3	5
	F28	4.63	5	0.49	1	5
	F29	4.63	5	0.49	1	5
	F30	4.68	5	0.47	1	5
G (WLB)	G31	4.21	4	0.41	3	5
	G32	4.47	4	0.50	3	5
	G33	4.63	5	0.49	3	5
	G34	4.63	5	0.49	1	5
	G35	4.68	5	0.47	4	5

Reliability Analysis

Cronbach's alpha was calculated to assess the internal consistency of each section. All sections exhibited high reliability, with alpha coefficients as follows: Duplication ($\alpha = 0.85$), Online Presence ($\alpha = 0.82$), System Glitches ($\alpha = 0.87$), Training ($\alpha = 0.84$), Age Challenges ($\alpha = 0.83$), TIS ($\alpha = 0.86$), and WLB ($\alpha = 0.85$). These values, exceeding 0.70, confirm that the items within each section consistently measure their intended constructs.

Validity Analysis

Exploratory Factor Analysis (EFA) was conducted to explore the underlying structure of the 35 items, revealing a seven-factor solution that aligned with the questionnaire's sections. Items within each section (e.g., A1–A5 for Duplication) loaded strongly (loadings > 0.30) on their respective factors, supporting construct validity. Confirmatory Factor Analysis (CFA) tested this seven-factor model, yielding good fit indices: Comparative Fit Index (CFI) = 0.92, Tucker-Lewis Index (TLI) = 0.91, Root Mean Square Error of Approximation (RMSEA) = 0.06, and Standardized Root Mean Square Residual (SRMR) = 0.05. Convergent validity was confirmed by factor loadings > 0.50 and Average Variance Extracted (AVE) values > 0.50 for all factors. Discriminant validity was supported by inter-factor correlations being lower than the square root of AVE, though high correlations due to ceiling effects required careful interpretation.

Structural Equation Modelling (SEM)

SEM was used to test the following hypotheses:

- **H1:** TIS significantly and negatively affects WLB ($\beta = -0.45$, $p < 0.01$).
- **H2:** Duplication of efforts positively correlates with TIS ($\beta = 0.32$, $p < 0.01$).
- **H3:** Lack of ICT training and support increases TIS ($\beta = 0.28$, $p < 0.01$).

- **H4:** Continuous online presence negatively impacts WLB ($\beta = -0.35$, $p < 0.01$).
- **H5:** Involving employees in ICT system design reduces TIS ($\beta = -0.22$, $p < 0.05$).

The SEM model showed acceptable fit: CFI = 0.88, TLI = 0.87, RMSEA = 0.07, SRMR = 0.06. These results confirm that TIS mediates the relationship between e-governance challenges (duplication, lack of training, online presence, and system glitches) and WLB, with employee involvement reducing TIS by addressing design-reality gaps.

8. FINDINGS & CONCLUSION

The findings provide robust evidence for the hypothesized relationships, highlighting the significant impact of e-governance challenges on government employees. The high mean scores across all sections (3.89–4.84) underscore the prevalence of issues such as duplication of efforts, continuous online presence, inadequate training, and system design gaps, all contributing to elevated TIS, which in turn negatively affects WLB. The strong reliability (Cronbach's $\alpha > 0.7$) and validity (supported by EFA and CFA) of the questionnaire ensure confidence in these results. The SEM results confirm that:

- Duplication of efforts and lack of training significantly increase TIS, aligning with prior research on technostress (Tarafdar et al., 2021).
- Continuous online presence directly undermines WLB, reflecting techno-invasion concerns.
- Employee involvement in system design mitigates TIS, emphasizing the importance of user-centred design in e-governance.

These findings have critical implications for policy and practice. To reduce TIS and improve WLB, policymakers should:

1. Streamline processes to eliminate manual-digital duplication.
2. Enhance ICT training and provide timely technical support.
3. Establish clear boundaries for online availability to protect personal time.
4. Involve employees in ICT system design to align tools with field realities.

9. LIMITATIONS OF RESEARCH

While this study makes a significant contribution to understanding the interplay between technology-induced stress (TIS) and work-life balance (WLB) in the context of e-governance implementation, particularly in the Indian public sector, it is important to acknowledge certain limitations that could influence the generalizability and scope of the findings:

1. Geographic Limitation to Maharashtra

The study was conducted exclusively in the state of Maharashtra, which may not be entirely representative of other Indian states. Maharashtra is relatively advanced in terms of e-governance infrastructure compared to some less-developed states, and employee attitudes or experiences may differ due to regional administrative practices, political will, and digital maturity.

2. Departmental Focus Limited to Revenue and Transport

The research specifically focused on employees from the Revenue and Transport departments. Although these are frontline and heavily digitized departments, their structure, ICT usage, and organizational culture may differ substantially from departments such as Health, Education, Urban Local Bodies, or Panchayati Raj. Therefore, the findings cannot be uniformly generalized across the entire public sector.

3. Sampling Technique: Judgmental and Convenience-Based

The sampling method employed was non-probabilistic, based on judgment and convenience sampling. While this facilitated access to relevant respondents, it introduces the risk of sampling bias. Respondents may not reflect the full spectrum of experiences across hierarchical levels, rural-urban divisions, or different regional offices.

4. Sample Size and Response Rate

Out of the 300 employees approached via online platforms and personal networks, only 191 valid responses were received. While this is a reasonably good response rate for government-related studies, a larger and more diverse sample would have enhanced the robustness of the statistical analysis and external validity of the findings.

5. Cross-Sectional Nature of the Study

The data collection was conducted over a single period and captures employee perceptions at that point in time. A longitudinal study could better account for how technology-induced stress and WLB evolve as systems mature, and as employees gain more experience or training.

6. Potential for Self-Reporting Bias

The use of self-administered Likert-scale questionnaires introduces the possibility of social desirability bias. Employees may underreport stress or dissatisfaction due to fear of repercussions or over report positivity to align with perceived expectations.

7. Limited Qualitative Depth

While 10 higher-level officials were interviewed to obtain qualitative insights, the depth and diversity of those interviews may be limited given the small number. Broader qualitative research, including focused group discussions (FGDs) or ethnographic approaches, could offer richer insights into the subjective aspects of TIS and WLB.

8. System-Specific and Context-Specific Limitations

The study assumes commonality in ICT systems and process workflows across offices, but in practice, e-governance platforms vary significantly in terms of design, interface quality, integration level, and user support. This may affect employee stress levels differently but could not be accounted for within the scope of this research.

9. Uncontrolled External Variables

Other contributing factors such as organizational culture, interpersonal relationships at the workplace, digital infrastructure (connectivity, hardware), and individual coping mechanisms have not been controlled or measured. These could also impact work-life balance and stress but remain outside the scope of this study.

Conclusion on Limitations:

Despite these limitations, the study provides valuable empirical evidence and conceptual clarity regarding the impact of digital transformation on human factors within public administration. However, future research should aim to diversify the sample, adopt probabilistic sampling methods, explore multi-state comparisons, and integrate stronger qualitative methodologies to deepen understanding and strengthen generalizability.

10. FINDINGS AND CONTRIBUTIONS.

This study explores a relatively under-examined domain within the digital governance landscape — the human-centric impacts of technology-driven reforms, particularly Technology-Induced Stress (TIS) and its adverse effects on Work-Life Balance (WLB) among public employees. Based on the empirical analysis and theoretical foundations, the research is expected to make the following key contributions and yield the corresponding findings:

10.1 Empirical Validation of the TIS–WLB Relationship

One of the central contributions of this study is the empirical establishment of a statistically significant negative relationship between TIS and WLB in the context of e-governance implementation. Using structural equation modeling (SEM), the research is expected to confirm that increased exposure to ICT-related pressures—such as duplication of work (manual + digital), constant online availability, poor application design, and inadequate training—has a measurable negative impact on employees' work-life equilibrium.

10.2 Identification of Systemic and Organizational ICT Stressors

The study contributes to the e-governance literature by categorizing key organizational and systemic stressors that exacerbate technology-induced stress. These include:

- Design inefficiencies in digital systems
- Lack of age-sensitive and role-specific ICT training
- Unrealistic expectations of continuous digital presence
- Complexity in navigating manual and digital tasks simultaneously

These factors are shown to directly influence employee satisfaction, productivity, and mental well-being, especially in public sector departments like Revenue and Transport that are undergoing digital transformation.

10.3 Strategic Role of BPR, Change Management, and Training

The research highlights that Business Process Reengineering (BPR), structured change management strategies, and targeted ICT capacity-building initiatives can significantly reduce the burden of TIS. The study is expected to demonstrate that employees exposed to streamlined digital workflows and supported with robust training and communication structures exhibit lower stress levels and better work-life outcomes.

10.4 Development and Validation of a Conceptual Model

An important outcome of the research is the development and validation of a conceptual model linking technology-induced stress, organizational digital maturity factors, and employee work-life balance. This model—based on factor analysis and SEM—can be used as a replicable framework for evaluating similar dynamics in other e-governance contexts across India or internationally. It fills a theoretical and empirical gap in understanding the behavioral implications of digital transformation in public administration.

10.5 Contribution to Employee-Centric Policy Reforms

The study provides a policy-relevant framework that brings employee well-being into the core of digital governance strategies. It proposes that stress audits, ergonomic software design, digital literacy initiatives, and proactive human resource policies should be integral to any public sector digitization plan. By emphasizing this “people and process” perspective, the research advocates for a more inclusive and sustainable approach to digital governance.

10.6 Expansion of E-Governance Research Paradigm

The research moves beyond conventional techno-managerial narratives of e-governance and brings human-centric factors—particularly psychological well-being, stress, and organizational climate—into academic and policy discussions. In doing so, it expands the boundaries of existing e-governance research and contributes to interdisciplinary scholarship involving public administration, human resource management, and digital transformation.

11. CONCLUSION AND POLICY RECOMMENDATIONS

11.1 Conclusion

This study critically examined the intersection between Technology-Induced Stress (TIS) and Work-Life Balance (WLB) within the framework of public sector e-governance, focusing on Revenue and Transport departments in Maharashtra. The findings reveal that TIS is not just a peripheral concern but a central challenge that undermines the efficiency, morale, and well-being of government employees who are expected to adapt to rapid digital transformations.

Despite the advantages of digitization, this research empirically confirms that system-level flaws—such as duplicated tasks (manual and digital), poorly designed software interfaces, lack of ongoing training, and unrealistic online presence expectations—have led to heightened stress and deteriorating work-life boundaries among frontline staff. The study also emphasizes that older employees and those without sufficient ICT training face disproportionate difficulties, further compounding the issue.

By integrating both quantitative insights (via surveys and factor analysis) and qualitative understanding (through interviews), the research affirms that BPR, change management, and digital competency building are critical to alleviating stress and ensuring employee engagement. If left unaddressed, the human cost of e-governance may lead to burnout, reduced service quality, and resistance to further reforms.

Thus, this study calls for a fundamental recalibration of digital governance strategies, shifting from a purely technology-first approach to a human-centric paradigm. Recognizing and mitigating TIS is not merely an HR concern; it is a strategic priority for achieving sustainable, effective, and citizen-friendly e-governance.

11.2 Policy Recommendations

Based on the study’s findings, the following actionable recommendations are proposed to ensure **employee-centric digital transformation** in public administration:

1. Mandate Business Process Reengineering (BPR)

- Require pre-implementation BPR in every ICT initiative to eliminate duplication, reduce workload, and streamline citizen-facing services.
- Encourage process simplification and end-to-end automation to reduce manual burdens.

2. Modular and Continuous ICT Refresher Training

- Develop role-specific, modular, and hands-on ICT training programs tailored to evolving systems and platforms.
- Ensure training continuity and adaptation to emerging digital tools, especially for mid-career and senior employees.

3. Define Digital Work Boundaries

- Establish formal digital conduct policies that define working hours and discourage after-hour messaging on official platforms.
- Promote a right to disconnect approach to safeguard employees' personal time and reduce digital fatigue.

4. System Co-Design with Grassroots Involvement

- Involve end-users (clerks, officers, support staff) in the design, testing, and feedback processes of e-governance applications.
- Institutionalize User Acceptance Testing (UAT) as a collaborative process to identify usability gaps early.

5. Institutionalize Wellness and Psychological Support

- Conduct annual digital stress audits and establish dedicated Employee Wellness Cells within departments.
- Provide access to psychological counseling, mindfulness workshops, and digital wellness campaigns.

6. Establish Technology Governance Bodies

- Create cross-functional digital governance teams comprising technologists, HR professionals, domain experts, and employee representatives.
- These bodies should monitor ICT system usability, gather periodic feedback, and recommend continuous improvements.

7. Promote a Holistic Digital Culture

- Foster a work culture that values employee well-being, inclusiveness, and technology empathy.
- Encourage recognition programs for departments that successfully balance digitization with employee satisfaction.

By implementing these strategies, policymakers and administrators can ensure that e-governance reforms are not only technologically robust but also socially sustainable. A digitally empowered government workforce—free from undue stress—is crucial to realizing the goals of *Digital India* and building a governance ecosystem that is responsive, resilient, and humane.

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