Invisible costs of digitization: technostress in India's financial sector

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Abstract

India's financial sector is undergoing rapid digital transformation, driven by initiatives like Digital India and fintech innovations. While these changes enhance efficiency and financial inclusion, they also introduce technostress psychological strain caused by digital overload, evolving skill demands, and techno-invasion. This paper explores technostress as an emerging yet under-addressed challenge in India's banking sector, highlighting its invisible costs on employee productivity, decision-making, and mental well-being. The study emphasizes the need for policy interventions, empathetic digitalization strategies, and organizational support mechanisms to mitigate technostress and ensure a sustainable, human centric digital economy aligned with India's Viksit Bharat 2047 vision.

Keywords: Techno-stress, Financial sector, Productivity, Decision making, Mental well-being

Introduction

Digital transformation in India is a multifaceted process aimed at enhancing economic growth, fostering self-reliance, and improving efficiency across various sectors. This transformation is driven by the integration of digital technologies, which are essential for fostering innovation and strengthening operational capabilities. Within the financial sector, this shift is accelerated by initiatives such as Digital India, which advocate for widespread adoption of digital payments, fintech innovation, and inclusive financial access. With policies emphasizing digital payments, fintech innovations, and expanding financial inclusion, technology has become deeply embedded in banking and financial services.

As institutions increasingly embrace AI-enhanced services and tech-driven systems to remain competitive, new challenges have emerged particularly those affecting the human workforce. While digital transformation brings significant advancements, it also introduces new challenges that often go unnoticed. One of the most pressing human-centric challenges is technostress-a psychological strain resulting from individuals' inability to cope with modern technological changes, digital overload and evolving skill demands (Tarafdar *et al*., 2017). Technostress arises from rapid technological changes, digital overload, and evolving skill expectations, leading to cognitive, emotional, and behavioral pressures on employees. The proliferation of AI-enhanced banking services, the expansion of fintech ecosystems, and the continuous drive for efficiency have intensified the technological demands on financial institutions. Although these innovations promise improved service delivery, cost efficiencies, and broader financial inclusion, they simultaneously impose cognitive and emotional pressures on employees, especially within banking, which is both technology-intensive and customer-facing. These pressures referred to as the "invisible costs" of digital transformation manifest in reduced productivity, poor decision-making, job dissatisfaction, and even mental health consequences. As Mehta & Sundararajan (2022) [8] note, while digital ecosystems enhance accessibility and competitiveness, they also introduce subtle workplace stressors that hinder human adaptability.

Consider a relationship manager at a Mumbai branch who begins her workday managing five different digital systems simultaneously responding to customer queries on WhatsApp, processing loan applications through AI-powered platforms, monitoring sales dashboards, attending virtual training on updated KYC protocols, and managing an overflowing email inbox. By midday, she reports feeling mentally exhausted despite handling fewer customers than she did five years ago. This experience reflects what researchers term technostress.

For banking professionals, who are required to constantly adapt to new digital systems while managing customer expectations, these pressures can result in reduced productivity, impaired decision-making and spill-over effects. The banking sector is particularly vulnerable to these adverse outcomes. While digital inclusion enhances access and operational efficiency, it simultaneously imposes a cognitive load on employees, making technostress an unavoidable consequence of the ongoing digital revolution in India's financial landscape. Thus, while digital transformation continues to reshape India's financial sector, addressing the employee-centric implications of this shift is critical for sustainable growth and organizational wellbeing. This paper explores technostress as an emerging yet under-addressed challenge in India's banking sector, highlighting its invisible costs on employee productivity, decision-making, and mental well-being

Understanding technostress
Definition and evolution
The term "Technostress" was first introduced by Craig Brod (1984) in the book 'Technostress: The Human Cost of the Computer Revolution' when personal computers were just starting to infiltrate workplaces, describing it as a "modern disease of adaptation caused by an inability to cope with new computer technologies." Over the decades, technostress has evolved beyond mere computer usage, encompassing a broader spectrum of digital technologies such as AI, mobile banking apps, CRM systems, and cybersecurity protocols (Tarafdar et al., 2015) [12]. Technostress has evolved into a complex and pervasive challenge, fueled by ongoing digital transformation that continues to redefine workplace dynamics, communication norms, and everyday technological interactions. Table 1 depicts how techno-stress evolved over the years.

Table 1: Evolution of technostress over years

Period	Key Developments
1980s–1990s	▪ Coined by Craig Brod (1984); minimal tech presence in India ▪ Stress limited to IT professionals and academics using early computing systems
2000s	▪ IT outsourcing boom increases tech exposure ▪ Rise of techno-overload and techno-complexity in call centers and software firms ▪ Initial studies emerge
2010–2015	▪ Smartphone adoption expands digital interaction and blurs work-life space ▪ Technostress impacts banking, education, healthcare ▪ Academic interest intensifies
2016–2020	▪ CRM systems and mobile banking cause frontline stress ▪ Empirical research links stress to productivity ▪ Technostress evolves to include data privacy concerns, cybersecurity, and the need to upskill continually
2020–2024	▪ Pandemic forces remote work and online service delivery ▪ Surge in techno-invasion and techno-uncertainty ▪ Bibliometric spike in Indian research
2025 Onward	▪ Technostress seen as a strategic HR and policy issue ▪ Studies focus on inhibitors and sectoral interventions ▪ Interest grows in technostress audits

The study of technostress has evolved considerably since Brod's foundational work. Early research in the 1980s and 1990s treated technostress primarily as an individual adaptation problem—assuming that proper training would resolve technological anxieties. This perspective positioned technostress as a temporary phenomenon that would disappear as workers gained familiarity with computers.

However, research in the 2000s revealed more complex dynamics. Weil and Rosen (1997) [14] demonstrated that technostress persisted even among experienced technology users, suggesting systemic rather than individual causes. Tarafdar et al. (2007) [13] developed a comprehensive conceptual framework identifying how specific technological characteristics create stress, mediated by organizational context and individual differences. Their work established technostress as a legitimate organizational concern requiring structural interventions rather than merely individual adaptation.

The 2010s brought increased sophistication to technostress research. Ayyagari et al. (2011) [2] distinguished between technological features and techno-stressors, arguing that technology itself doesn't inherently cause stress—rather, stress emerges from how organizations implement and manage technology. This distinction proved crucial for developing effective interventions. Tarafdar et al. (2014) further refined the concept by differentiating techno-eustress (positive, motivating technological challenge) from techno-distress (negative, debilitating strain), recognizing that technology can energize some employees while exhausting others.

Recent research has expanded beyond individual psychological impacts to examine team dynamics, organizational culture, and broader societal implications. La Torre et al. (2019) [7] explored how technostress affects work-family balance, particularly as remote work technologies erase traditional boundaries between professional and personal life. Bondanini et al. (2020) [3] conducted a comprehensive scientometric analysis revealing exponential growth in technostress research, with emerging themes including artificial intelligence anxiety, cybersecurity concerns, and digital surveillance.

Types/Causes of Techno-stress (or techno-stressors)
Technology does not inherently induce stress; instead, technostress arises from the organizational context in which it is introduced, the expectations placed on employees, and the degree of support offered during its implementation. Techno-stressors are the events faced by individuals (Ayyagari et al., 2011) [2]. These have the potential to create dress in an organisation's environment due to interaction with ICTs (Hang et al., 2022) [6]. Identifying and understanding the causes of techno-stress can help in developing policies and strategies for integrating technology with employees in a healthy manner. Various authors have identified several reasons for techno-stress, known as techno-stressors or techno-stress creators.
Broadly it can be categorized into five key dimensions:
➢ **Techno-overload**: Employees are forced to work faster and longer.
➢ **Techno-invasion**: Technology blurs work-life boundaries.

- ➢ **Techno-complexity**: Systems are too complicated, making employees feel inadequate.
- ➢ **Techno-insecurity**: Fear of job loss due to technological advancements.
- ➢ **Techno-uncertainty**: Frequent changes in technology causing stress.

Technostress in India's financial sector
Digitalization trends in banking & finance
The Indian financial sector is witnessing unprecedented digitization:

- Banks are increasingly adopting AI-driven customer service bots, digital KYC, and blockchain for secure transactions.
- Government initiatives like Jan Dhan Yojana, Aadhaar-based services, and RBI's Digital Currency further necessitate technological adoption across all banking layers.

Technostressors in the financial sector
While these digital initiatives enhance operational efficiency, they inadvertently escalate techno-stress levels among employees. Research reveals sectoral and institutional disparities in technostress exposure.

- Private banks often push digital sales aggressively, leading to techno-overload and performance pressure.
- Regional rural banks face techno-complexity due to legacy systems coexisting with new software—resulting in system incompatibilities and duplication.
- Public sector banks, while slower to digitize, grapple with techno-insecurity amid automation of clerical tasks.

A recent study by Sharma & Ghosh (2023) involving banking professionals across five states reported that 68% experienced moderate-to-high technostress symptoms, with urban branches showing higher techno-invasion and rural branches displaying greater techno-complexity. These patterns align with infrastructural and training asymmetries observed in regional banking contexts. Table 2 shows examples of techno-stress creators in financial sectors.

Table 2: Techno-stressors in financial sector

Techno-stressor	Manifestation in the financial sector
Techno-Overload	Pressure to handle increased volumes of online transactions and digital services.
Techno-Invasion	Constant accessibility via mobile apps and remote work expectations.
Techno-Complexity	Struggling with complex fintech systems, AI platforms, and regulatory tech updates.
Techno-Insecurity	Fear of being replaced by AI-driven automation and digital-only banking models.
Techno-Uncertainty	Frequent updates in compliance protocols and evolving cybersecurity threats.

Invisible costs: Impacts and outcomes
Techno-stress results in a variety of outcomes such as dissatisfaction, fatigue, anxiety, and overwork, leading to a negative effect on individual productivity (Tarafdar *et al*., 2007; Alam, 2016; Ragu-Nathan, 2008) [13]. Technostress manifests in multiple adverse outcomes, often interlinked and cascading, as shown as Table 3. Increased reliance on technology has introduced a 'dark side' for employees, contributing to techno-stress: strain caused by excessive digital interaction and system complexities (Bondanini *et al*., 2020) [3].

Table 3: Technostress manifests in multiple adverse outcomes

Outcome	Manifestation
Cognitive Strain	Fatigue, attention fragmentation, reduced executive functioning
Productivity Drop	Missed deadlines, lower output quality, task avoidance
Resistance Behavior	Passive resistance, refusal to adopt new technologies
Emotional Burnout	Anxiety, withdrawal, detachment from organizational goals
Attrition Risk	Turnover intention, especially among younger and mid-career professionals

Studies by Das & Bandyopadhyay (2022) found that productivity in digitized banking environments was significantly mediated by technostress levels. Employees reporting high technostress scored lower on customer engagement metrics and had higher absenteeism rates.

Barriers to addressing technostress
Despite its critical implications, techno-stress remains under-addressed in the Indian financial sector. Key barriers include:

Lack of Awareness
Organizations often prioritize technology infrastructure over employee digital well-being. The intangible nature of technostress makes it less visible in performance evaluations.

Policy Myopia
Digital policies largely focus on infrastructure, digital literacy for customers, and cybersecurity, neglecting employee adaptability and psychological readiness.

Inadequate Training & Support
Most digital training programs are tool-specific rather than stress-management oriented. Employees are expected to learn on-the-go, which escalates techno-complexity and frustration.

Organizational culture resistance
Leadership often underestimates the emotional impact of digitization, perpetuating a culture where asking for support is seen as incompetence.

Implications for policy and practice

Technostress demands recognition within national development frameworks such as *Viksit Bharat 2047* and the evolving Digital India 2.0 roadmap. Recommendations include:

- **Structured Digital Training**: Mandatory onboarding for new tech tools with certification modules.
- **Techno-ergonomic Design**: User-friendly platforms and reduced system redundancy.
- **Managerial Empathy**: Supervisors trained to recognize stress signals and offer support.
- **HR Policy Evolution**: Inclusion of digital wellness in performance management and wellbeing assessments.
- **Tech Deployment Strategies**: Phased rollouts, sandbox testing, and employee feedback integration.
- **Mindfulness Training:** Workplace mindfulness programs, paired with IT-literacy training, lead to reduced technostress, increased job satisfaction, and improved performance.

These interventions, when linked with leadership commitment and employee involvement, can transform technostress from a productivity drain to a catalyst for inclusive transformation.

Conclusion

While digitization has unlocked new efficiencies in Indian banking, its invisible costs—particularly technostress—require urgent academic and policy attention. Viewing workplace technology adoption as both a technical and human transformation is essential. This chapter advocates for empathetic digitalization: systems designed not only for functionality, but also for mental ergonomics and sustainable human engagement. Future research should expand empirical validation of technostress models across sectors, refine measurement tools, and link technostress mitigation to organizational performance outcomes.

Exploring technostress as an emerging challenge in India's financial sector amidst the aggressive push for digital transformation. While Digital India initiatives aim to catalyse growth through technology, the hidden psychological costs borne by employees can hamper productivity and impede the nation's journey towards a Viksit Bharat. Addressing technostress is thus critical for ensuring a sustainable and human-centric digital economy.

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