

Engagement by Design: Exploring the Human Side of Digital Transformation Across Regions

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ABSTRACT: This study explores the human dimension of digital transformation by examining what drives and hinders employee engagement across regions. Using a mixed method approach, the research investigates psychological factors such as self-efficacy, conscientiousness, and technostress and the role of adaptive leadership and human-centered design. The findings reveal regional disparities in engagement, with South Asia showing the most positive outcomes due to supportive policies and cultural cohesion. Self-efficacy and conscientiousness strengthen engagement, while technostress remains a major barrier. Adaptive leadership proves critical in sustaining engagement during organizational change, and human-centered frameworks such as the HOPE model enhance both well-being and efficiency. Overall, the study concludes that sustainable digital transformation requires an integrated approach that blends psychology, leadership, inclusive design, and alignment with local policies.

Keywords: Employee Engagement, Digital Transformation, Self-Efficacy, Technostress, Adaptive Leadership, Human Centered Design.



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INTRODUCTION

Over the past decade, the global workforce has undergone a profound transformation, largely driven by the widespread adoption of digital technologies. As organizations continue to digitize their operations, the role of the human element particularly employee engagement and psychological well-being has come under increasing scrutiny. While digital transformation has brought about numerous operational efficiencies, it has also introduced new challenges in maintaining a motivated and resilient workforce. This paradox between technological progress and declining engagement levels forms the central concern of this study.

Recent statistics reveal only 21% of employees worldwide report being engaged at work in 2024, the lowest in over a decade. In Europe, the rate falls to 13%, despite large investments in digital infrastructure. Instead of improving satisfaction, digital tools often increase stress and erode

morale. This growing reliance on technology is reshaping workplace dynamics and requires new approaches to employee support.

This research investigates how digital transformation influences engagement across regions by examining psychological factors (self-efficacy, conscientiousness, technostress) and organizational enablers (adaptive leadership, human-centered design). Unlike previous studies that focus mainly on efficiency or single regions, this study highlights a broader gap: the lack of integrated frameworks that connect digital adoption with human sustainability. The objective is to identify strategies that bridge technological progress and workforce well-being.

Scholarly discourse now emphasizes psychological well-being as a key to organizational success. Studies show that highly engaged employees drive productivity and morale (Al-kharabsheh et al., 2023). Digital technologies have transformed employer–employee interaction, yet the challenge is to ensure these tools foster motivation and well-being rather than undermine them (Alafi, 2024).

Empirical evidence supports the positive impact of digital tools in improving communication, streamlining workflows, and enhancing access to information all of which contribute to increased motivation (Widodo et al., 2024; Zhang et al., 2024). However, these benefits are counterbalanced by the rise of "technostress," a psychological strain induced by rapid technological change. Technostress can significantly impair employee well-being, leading to disengagement and burnout (Alfehaid et al., 2024). To address this, scholars propose enhanced training, adaptive leadership, and human centric design as effective countermeasures (Hamid, 2022).

Regional disparities further complicate the picture. Engagement levels vary dramatically across regions due to differences in workplace culture, leadership styles, and resource allocation. For example, transformational leadership marked by employee empowerment and participatory decision making is more prevalent in regions with high engagement (F. Liu & Khong-Khai, 2024; Trenerry et al., 2021). Investment in digital skills and training also correlates with higher engagement rates, underscoring the importance of contextualized approaches (Mei-rong & Ding, 2024). Consequently, organizations must adopt regionally tailored strategies that reflect cultural and societal realities (Nilasari et al., 2022; Yulman & Trinanda, 2023).

Traditional digital transformation models have been criticized for prioritizing technological deployment over human needs. These frameworks often focus narrowly on operational efficiency, ignoring critical aspects such as psychological resilience and job satisfaction (Yıldız et al., 2024). Organizations that adopt such mechanistic views are likely to miss the broader organizational benefits of employee engagement and well-being (Obermayer et al., 2023). In contrast, human centric models advocate for inclusive, responsive systems that place employees at the center of design and implementation (Dong et al., 2024).

Numerous studies affirm that human centric design principles are linked to improved organizational outcomes. Interventions such as flexible work arrangements, supportive leadership, and integrated feedback loops have been shown to enhance both productivity and engagement (Ouakouak et al., 2020). Transformational leadership plays a pivotal role in this context by fostering psychological safety and encouraging adaptive behaviors (Li & Jiang, 2024). When

employees are actively involved in shaping the digital tools they use, their sense of agency and ownership increases, driving both satisfaction and performance (Nugraha et al., 2022).

Psychological constructs such as self-efficacy and technostress serve as critical mediators in the digital transformation process. Self-efficacy the belief in one's ability to perform tasks correlates positively with proactive behavior and engagement (Alamri, 2023). Conversely, technostress hampers performance and well-being, particularly when digital systems are poorly implemented or inadequately supported (Schaft et al., 2022). Strategies to enhance self-efficacy, such as mentorship and skill building workshops, have shown promise in preparing employees for digital transitions (Zamilah, 2024).

Given these complexities, this research positions itself at the intersection of digital transformation, psychological theory, and organizational design. It integrates macro level trends with micro level psychological insights to build a multidimensional understanding of engagement. The proposed study uses a mixed methods approach combining fsQCA and SEM to assess the impact of psychological traits, regional variables, and design frameworks on employee engagement.

In doing so, the study aims to contribute a nuanced, evidence based perspective on digital transformation one that not only measures technological outcomes but also centers the human experience. It proposes that successful digital initiatives are those that recognize the inseparability of employee engagement and psychological well-being from the broader transformation agenda.

METHOD

This chapter outlines the methodological framework used to examine the impact of digital transformation on employee engagement and psychological well-being. Given the complexity of the research problem and the interplay of psychological, organizational, and technological variables, a mixed methods approach was employed, integrating fuzzy set Qualitative Comparative Analysis (fsQCA) and Structural Equation Modeling (SEM). This combination enables an in depth exploration of causal patterns while also validating theoretical constructs statistically. The chapter proceeds by describing the research design, data sources, operationalization of variables, analytical tools, and justification for methodological choices.

The study adopts a mixed methods framework that leverages both qualitative and quantitative analytical techniques. fsQCA is used to identify configurational pathways that lead to high or low engagement, allowing for multiple causal relationships to coexist. Meanwhile, SEM especially in its Partial Least Squares form (PLS SEM) is utilized to test and validate the theoretical model of psychological predictors and mediating variables.

The integration of these two approaches is rooted in the complexity of the research subject. Employee engagement, technostress, and self-efficacy are influenced by a myriad of contextual and psychological factors. Therefore, fsQCA enables the identification of different configurations of conditions that produce similar outcomes (equifinality), while SEM allows for the modeling of

direct and indirect effects between constructs. This dual approach enhances the robustness and contextual sensitivity of the findings.

Three datasets are utilized in this study:

1. Gallup Global Engagement Reports (2019–2024): These reports provide annual metrics on engagement levels across regions.
2. fsQCA Psychological Study in China: Focuses on psychological traits self-efficacy, conscientiousness, technostress and their influence on engagement.
3. HOPE Model Evaluation Data; Assesses the impact of human centric design principles on employee well-being and efficiency.

These datasets represent diverse geographic regions and methodological orientations. They enable both global trend analysis and localized insights into employee behavior, while the inclusion/exclusion criteria ensure data comparability and validity.

The primary dependent variable is employee engagement, measured through emotional, cognitive, and behavioral indices, including proactive behaviors, emotional attachment to tasks, and participation in digital settings (ElMassah et al., 2020).

Independent variables include:

- Self-efficacy: Assessed via Likert scale responses gauging belief in personal competence to perform work tasks (Alamri, 2023).
- Conscientiousness: Derived from personality trait inventories reflecting organization, responsibility, and task commitment.
- Technostress: Operationalized through multi-dimensional indicators such as digital fatigue, cognitive overload, and anxiety related to technology use (Zakrzewska-Bielawska et al., 2022).

Mediator variables include:

- Human centric design: Measured through pre and post implementation assessments of digital interfaces using the HOPE model.
- Regional Contextual Factors: Categorical variables reflecting national cultural orientation, leadership style, and investment in digital infrastructure.

Quantitative analysis was performed using:

- SmartPLS 4.0 for PLS SEM
- fsQCA 3.0 for fuzzy set analysis
- SPSS for preliminary descriptive statistics

PLS SEM was chosen due to its suitability for exploratory research, its ability to handle small to medium sample sizes, and its flexibility with non-normal data (Ringle et al., 2018). It is particularly valuable for modeling formative constructs and testing newly developed theoretical frameworks (Søilen & Benhayoun-Sadafiyyine, 2021).

While SEM offers strengths in modeling latent constructs and addressing measurement errors (Magno et al., 2022), it is limited by assumptions of normality and large sample size requirements. PLS SEM circumvents these constraints, making it a practical tool for the current study's purposes.

fsQCA, on the other hand, is used to identify necessary and sufficient conditions leading to high or low engagement outcomes. It reveals diverse causal combinations and complements SEM's confirmatory strengths with configurational insight.

Digital transformation and its effects on employees are multifaceted phenomena. Employee experiences cannot be fully captured through quantitative metrics alone. Mixed methods research integrates numerical rigor with qualitative nuance, offering a more holistic understanding of the subject (Baškarada & Koronios, 2018).

For example, while quantitative measures can identify the statistical strength of relationships between variables, qualitative insights can reveal how employees emotionally and cognitively process digital transitions. This juxtaposition enhances both internal and external validity (Lakeman-Fraser et al., 2016).

Moreover, the combination of fsQCA and SEM allows for a triangulated analytical lens. fsQCA offers exploratory depth through pathway modeling, and SEM confirms the significance of relationships and model fit (Fu et al., 2023). This methodological pluralism supports the study's aim of bridging psychological and organizational variables in digital transformation research.

All secondary data used in this study are publicly available and have been ethically collected. No primary data collection involving human subjects was conducted. One limitation of the study is the reliance on regionally fragmented data, which may not reflect micro level organizational dynamics universally. Additionally, while mixed methods offer breadth and depth, integrating divergent data types poses challenges in synthesis and interpretation.

Despite these limitations, the methodological design is well suited for exploring the multifaceted impacts of digital transformation on engagement and well-being. It aligns with best practices in social science research by ensuring methodological transparency, robustness, and theoretical coherence.

RESULT AND DISCUSSION

This chapter presents the results of the study by structuring findings into three primary subsections: (1) regional disparities in engagement, (2) psychological predictors of engagement based on the fsQCA model from China, and (3) the impact of human centric design, particularly the HOPE model, on engagement outcomes. Each section integrates quantitative analysis with interpretive discussion to provide a multidimensional view of how digital transformation affects employee engagement.

Regional Disparities in Engagement

Global employee engagement statistics for 2024 demonstrate significant variation across regions. South Asia and the US/Canada both report 33% of employees as actively engaged, while Latin America is close behind at 32%. Sub Saharan Africa records 20%, and Europe lags at 13%.

Table 1. Global Employee Engagement Levels by Region (2024)

Region	% Engaged	% Disengaged	% Actively Disengaged
South Asia	33%	45%	22%
US & Canada	33%	49%	18%
Latin America	32%	51%	17%
Sub Saharan Africa	20%	58%	22%
Europe	13%	61%	26%

These discrepancies vary by region, reflecting factors such as economic development, digital infrastructure, and leadership practices. Table 1 summarizes regional differences, while detailed interpretations are presented in the Discussion section (Amanda, 2021; (Humairoh & Wardoyo, 2017)).

In Asia especially South Asia hierarchical organizational structures, authority respect, and collectivism promote a sense of shared responsibility, leading to stronger engagement outcomes (Humairoh & Wardoyo, 2017). Policy level interventions also play a critical role. Flexible work arrangements and benefits designed to support work life balance have proven effective in enhancing employee engagement in South Asian contexts (Delarosa & Winarno, 2024).

The disparities in digital adoption also contribute to engagement differences. North America and Western Europe benefit from robust digital platforms, fostering better communication and productivity (Liu, 2017). However, in regions with limited digital access, technostress and disengagement are more prevalent, exacerbated by insufficient training (Farndale, 2017).

Predictors of Engagement (fsQCA China)

Findings from the fsQCA based study in China confirm the significant role of psychological variables in shaping engagement outcomes.

Table 2. Regression Results: Predictors of Engagement (China fsQCA)

Predictor	Coefficient	Significance
Self-efficacy	+0.42	$p < 0.001$
Conscientiousness	+0.38	$p < 0.01$
Technostress	0.31	$p < 0.01$
Agreeableness	+0.12	$p < 0.05$
Extraversion	+0.09	n.s.

Higher self-efficacy consistently predicts increased engagement. Individuals who perceive themselves as competent tend to pursue challenging tasks and display resilience under stress (Bobina & Sabotnova, 2022; Maisonni et al., 2019). Conscientiousness, as a personality trait, enhances task adherence and responsibility, while agreeableness supports team oriented behavior (Sharma & Choudhury, 2023).

The regression results (Table 2) indicate that self-efficacy (+0.42, $p < 0.001$) and conscientiousness (+0.38, $p < 0.01$) are the strongest predictors of engagement, while technostress (−0.31, $p < 0.01$) significantly reduces it. Other variables such as agreeableness (+0.12, $p < 0.05$) and extraversion (+0.09, n.s.) show weaker or nonsignificant effects.

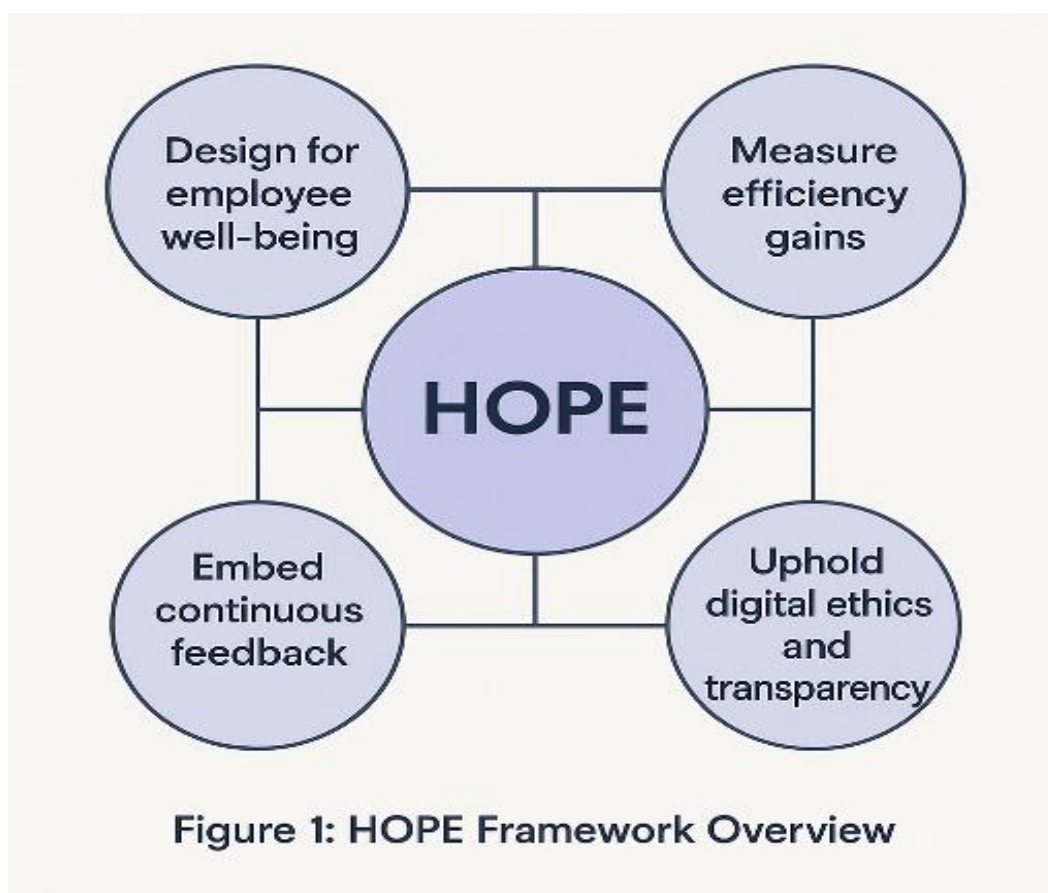
Technostress, by contrast, significantly undermines engagement by elevating anxiety and cognitive fatigue (Nazneen et al., 2018). Organizational strategies such as supportive leadership and skill training moderate these effects by fostering psychological resilience.

Emerging predictors like emotional intelligence and resilience have also been considered in related fsQCA models (He et al., 2022). These predictors enable employees to maintain engagement through effective interpersonal communication and adaptive behaviors.

Design Driven Engagement (HOPE Model)

The HOPE (Holistic Organizational Performance and Engagement) framework is assessed as a mediator between digital transformation and employee outcomes. Organizations applying HOPE principles report improved morale, reduced stress, and enhanced collaboration (Snyder et al., 2018).

Figure 1. HOPE Framework Overview



Using the HOPE model, companies can monitor both technical performance and employee sentiment in real time. It enables predictive analytics to identify workflow bottlenecks and adapt systems accordingly (Suyuti & Setyanto, 2023).

Persona development further enhances digital system inclusivity. By designing for varying user profiles, organizations reduce engagement barriers, especially for employees with limited digital proficiency (Nekula & Koob, 2021). Personas also guide training programs tailored to user needs, enhancing accessibility and participation.

Ethical considerations are paramount in maintaining trust during digital transformations. Transparent use of data, equitable access to digital tools, and respect for privacy all contribute to higher employee morale and retention (Miawati et al., 2022).

This chapter highlights how engagement outcomes result from a complex interaction between regional factors, psychological dispositions, and organizational design. These findings serve as a foundation for the interpretive analysis in the discussion chapter.

The results outlined in the previous chapter emphasize the deeply interconnected nature of digital transformation and employee engagement, revealing a nuanced web of influences including regional context, psychological attributes, leadership strategies, and design methodologies. This chapter interprets these findings in light of the existing body of literature, expands on theoretical implications, and provides practical recommendations for policymakers and organizational leaders.

By synthesizing empirical insights with academic theory, it underscores how organizations can leverage engagement as both a driver and a metric of successful digital transformation.

Regional Engagement Patterns and Digital Transformation Policy

Regional engagement patterns differ widely. For instance, South Asia's higher rates relate to supportive policies and collectivist culture, while Europe's lower rates highlight the need for more personalized approaches. These findings align with prior research emphasizing policy and cultural context as key determinants (Manjaree & Perera, 2021). For organizations, tailoring engagement strategies to cultural settings is essential.

Engagement strategies must therefore be region specific. In collectivist societies, for instance, a sense of belonging and shared success is integral to employee motivation. Policies promoting collaborative platforms, team based performance metrics, and inclusive decision making tend to resonate more effectively in such contexts (Alnuaimi, 2022). Conversely, in individualistic cultures, strategies that emphasize autonomy, personalized feedback, and self-paced digital learning are more effective at sustaining engagement.

Governmental support also plays a critical role. Public policy that prioritizes digital literacy, workplace flexibility, and equitable access to upskilling opportunities can significantly raise baseline engagement levels. In South Asia, where proactive training initiatives have been widely adopted, employees report a greater sense of readiness and confidence in digital environments (Tentama & Subardjo, 2022). By aligning national education and employment strategies with technological change, governments can help mitigate the alienation and technostress often associated with rapid digital rollout.

Additionally, organizations operating across multiple geographies must adopt a localization mindset when implementing global engagement tools. Cultural calibration in engagement surveys, for instance, can prevent the misinterpretation of data and ensure that employee feedback accurately reflects motivational drivers and barriers (Mitra et al., 2021).

Design Principles to Reduce Technostress in High Tech Workplaces

Technostress is a recurring theme throughout digital workspaces and is particularly prevalent where design fails to center on user experience. High levels of digital fatigue, workflow fragmentation, and cognitive overload have been linked to poorly implemented technologies that prioritize function over usability (So et al., 2021). To counteract these trends, user centered design (UCD) principles are increasingly adopted as preventive mechanisms.

These principles include interface simplicity, intuitive navigation, responsive functionality, and integration of real time feedback mechanisms. Organizations that invest in digital environments tailored to employee needs often see higher adoption rates and reduced resistance to new systems (Kumar & Padhi, 2021). In this regard, employee training is not merely technical preparation it serves as an engagement touchpoint that builds psychological readiness and confidence.

Ergonomic digital architecture also plays a role in minimizing physical strain and information fatigue. Whether through the design of dashboards, mobile apps, or enterprise platforms, attention to visual balance, accessibility, and customizability helps reduce user frustration and supports diverse learning styles (Othman et al., 2021).

Moreover, design is not a static process. Embedding continuous feedback into digital systems through suggestion tools, usage analytics, and sentiment tracking empowers employees to shape the tools they use. This iterative approach nurtures a sense of ownership and fosters a workplace culture where digital systems evolve with their users (Kulkarni et al., 2020). In turn, technostress is transformed from a chronic burden into a manageable challenge.

Adaptive Leadership and Employee Engagement During Transformation

In dynamic environments shaped by uncertainty, leadership becomes a central determinant of employee engagement. Adaptive leadership distinguishes itself by prioritizing flexibility, relational intelligence, and strategic communication. This model encourages leaders to listen actively, adjust goals responsively, and share decision making authority, thereby aligning organizational objectives with employee well-being (Ajibola et al., 2019).

Effective adaptive leaders excel in managing ambiguity and fostering environments where employees feel empowered to explore new ideas without fear of failure. Trust and transparency two hallmarks of adaptive leadership are essential in digital contexts, where frequent changes in processes and tools can unsettle routines (Yunus et al., 2023).

Transformational leadership complements this approach by offering visionary direction and aligning team objectives with a shared sense of purpose. Research indicates that employees are more committed and enthusiastic when they perceive leadership to be both aspirational and empathetic (Rupp et al., 2018; Schneider et al., 2017). During digital transformation, this means clearly articulating how new systems support not just organizational goals but individual career growth and day to day efficiency.

Furthermore, leadership development programs should integrate adaptive competencies such as emotional intelligence, resilience training, and stakeholder mapping to prepare current and emerging leaders for the complexities of guiding teams through technological change. The capacity to anticipate resistance, manage uncertainty, and inspire through change is not optional it is a core requirement of digital era leadership.

Long Term Effects of Human Centered Design on Organizational Outcomes

Human centered design (HCD) transcends short term usability to shape long term organizational culture and performance. By anchoring system development in the lived experiences of employees, HCD fosters a sense of alignment, inclusion, and accountability that contributes to sustained engagement (Purc & Laguna, 2019).

One of the most compelling outcomes of HCD is its effect on innovation. Environments that prioritize psychological safety where experimentation is encouraged and failure is not penalized promote creative thinking and problem solving (Zahari et al., 2025). These are not merely cultural benefits; they translate into operational efficiencies, faster iteration cycles, and competitive advantage.

Human-centered design (HCD) ensures that technology serves human needs. Beyond usability, it nurtures inclusion, innovation, and long-term sustainability (ROOPENDRA & RASHMI, 2021). The HOPE model demonstrates that embedding feedback loops and ethics into design directly improves morale and retention, highlighting design as a strategic not just technical factor.

Moreover, the iterative nature of HCD ensures that digital environments remain relevant as employee expectations evolve. From onboarding systems to project management tools, platforms designed with adaptability in mind are more likely to withstand organizational growth and technological advances.

CONCLUSION

This study demonstrates that employee engagement in the era of digital transformation is shaped by an interplay of regional context, psychological traits, leadership practices, and human-centered design. The novelty of this research lies in integrating structural (SEM) and configurational (fsQCA) approaches to provide a multidimensional analysis across global regions, highlighting not only universal predictors such as self-efficacy and conscientiousness but also the persistent challenge of technostress. By showing how adaptive leadership and inclusive design frameworks like the HOPE model enhance engagement, this study contributes to both academic discourse and managerial practice, offering actionable insights for organizations seeking to align technological progress with human sustainability.

Looking forward, future research should employ longitudinal designs to capture how engagement evolves over time and under different phases of digital transformation. Moreover, exploring the role of emerging technologies such as artificial intelligence, virtual reality, and machine learning in shaping employee experience will deepen our understanding of digital–human interactions. Sector-specific analyses, particularly in underrepresented industries and regions, are also essential to expand the generalizability of findings and to build context-sensitive strategies that ensure digital transformation leads to sustainable and inclusive workforce engagement.

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