

Review

Employee Well-Being, Job Satisfaction and Organizational Performance: An Integrative Review Through the Lens of Industry 5.0

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Abstract

The transition from Industry 4.0 to Industry 5.0 represents a shift toward human-centric work systems that prioritize employee well-being and meaningful human–technology collaboration. Research examining employee well-being, job satisfaction, and organizational performance in Industry 5.0 contexts remains conceptually fragmented and methodologically heterogeneous, limiting cumulative theoretical development. This study addresses how fragmented insights on employee well-being, job satisfaction, and organizational performance can be conceptually integrated through a human-centric operational excellence perspective. Accordingly, an integrative review was conducted using PRISMA 2020-guided screening and reporting procedures, resulting in a final sample of 84 peer-reviewed studies published between 2015 and 2025. The literature was analyzed through inductive thematic synthesis to identify recurring patterns, tensions, and conceptual configurations within digitally mediated work environments. The findings indicate that employee well-being and job satisfaction in Industry 5.0 contexts are multidimensional, dynamic, and frequently paradoxical: digital technologies simultaneously function as enablers of autonomy, meaningful work, and cognitive support while also generating technostress, algorithmic control, and cognitive overload. Relationships between well-being, satisfaction, and performance appear non-linear and context-dependent, with high performance sometimes coexisting with employee strain. In this sense, this study contributes to the Industry 5.0 literature by advancing human-centric operational excellence (HCOE) as an interpretive lens for reconciling human–technology tensions without presuming linear causal relationships.

Keywords: employee well-being; job satisfaction; organizational performance; Industry 5.0; human-centric operational excellence; integrative review; paradox theory



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1. Introduction

The transition from Industry 4.0 to Industry 5.0 represents a profound reorientation of industrial systems from a predominant focus on technology-driven automation and operational efficiency toward a human-centered model of value creation that positions employee well-being and resilience at the heart of technological advancement (Karbouj et al., 2024; Trstenjak et al., 2025a). Within Industry 5.0 workplaces, artificial intelligence, collaborative robotics, real-time sensing infrastructures, and cognitive augmentation technologies are no longer conceived primarily as substitutes for human labor. Instead, they are designed to

enhance, extend, and complement human capabilities. This paradigm shift carries significant implications for the nature of work and employee experience, prompting renewed attention to how digital efficiency interacts with psychological well-being, perceived meaningfulness, autonomy, and long-term human resilience in increasingly technology-intensive environments (Ghazy & Fedorova, 2022; Pacheco & Iwaszczenko, 2024). As organizations integrate advanced technologies more deeply into daily operations, understanding these dynamics becomes essential for developing sustainable, human-centric approaches to work design and organizational performance.

For decades, employee well-being and job satisfaction have been central constructs in organizational behavior and human resource management, commonly modeled through linear and unidirectional assumptions whereby higher well-being enhances job satisfaction and, in turn, individual and organizational performance (Bhoir & Sinha, 2024; Memon et al., 2023; Yang et al., 2024). However, the increasing integration of advanced digital technologies in contemporary work systems challenges these traditional assumptions. Emerging research highlights complex and often paradoxical effects: technologies that enhance efficiency, coordination, and cognitive capacity may simultaneously intensify technostress, algorithmic control, cognitive overload, constant connectivity, and perceived loss of autonomy (Adel, 2022; Pacheco & Iwaszczenko, 2024). As a result, positive and negative employee experiences increasingly coexist within the same work settings, producing heterogeneous and sometimes contradictory findings across the literature on digital transformation, technostress, meaningful work, and performance.

Despite growing scholarly interest, existing reviews on employee well-being, job satisfaction, and performance in digitally mediated work systems largely rely on linear or unidirectional assumptions, limiting their ability to explain paradoxical Industry 5.0 dynamics. Consequently, empirical findings remain fragmented and context-dependent, with positive performance outcomes frequently coexisting with employee strain or dissatisfaction. First, core constructs are operationalized inconsistently: employee well-being is alternately conceptualized as hedonic affect, eudaimonic meaning, or multidimensional experiential states, while job attitudes are variously treated as a single satisfaction–dissatisfaction continuum or as coexisting positive and negative evaluations. Second, relational logics vary substantially across studies: some implicitly assume linear and unidirectional relationships among well-being, job attitudes, and performance, whereas others describe reciprocal, cyclical, or internally contradictory dynamics, particularly under digitally mediated work design. Third, reported effects are highly contingent on contextual boundary conditions such as transparency of technology use, employee autonomy, digital literacy, leadership practices, and organizational support, rendering advanced technologies simultaneously associated with fulfilment and strain. Collectively, these inconsistencies hinder the development of a coherent, human-centric understanding of employee experience in Industry 5.0 work systems.

These unresolved tensions highlight the relevance of an integrative synthesis that clarifies how these constructions are related across heterogeneous Industry 5.0 contexts. In this regard, emerging streams of literature increasingly invoke human-centric operational excellence (HCOE) as a managerial philosophy that reconciles operational efficiency with profound human considerations in work system design. HCOE encompasses key practices such as ethical technology governance, employee participation and voice, role clarity, digital literacy, and the co-design of socio-technical systems (Carvalho et al., 2019; Ghazy & Fedorova, 2022). Rather than functioning as a discrete causal mechanism, HCOE is positioned as a contextual and interpretive lens through which paradoxical employee experiences in digitally mediated environments can be better understood and managed.

Against this background, this integrative review addresses the following central research question: How can fragmented understandings of employee well-being, job satisfaction, and organizational performance in Industry 5.0 be conceptually integrated through a human-centric operational excellence perspective? According, the aim of this study is to synthesize and critically integrate the fragmented literature on employee well-being, job satisfaction, and organizational performance in Industry 5.0 contexts while examining the interpretive role of human-centric operational excellence in explaining these dynamics.

To achieve this objective, the present integrative review is guided by three interrelated research questions that collectively address the identified conceptual, relational, and interpretive gaps in the literature:

- **RQ1.** How are employee well-being and job satisfaction conceptualized in the industry 5.0 literature, and what conceptual fragmentation emerges across studies?
- **RQ2.** How does the literature link employee well-being and job satisfaction to organizational performance in Industry 5.0 contexts, and what contextual conditions shape these relationships?
- **RQ3.** How is human-centric operational excellence positioned as an interpretive lens in the literature on employee well-being, job satisfaction, and organizational performance within Industry 5.0 work systems?

In this sense, the remainder of this article is structured as follows: Section 2 reviews the theoretical background and conceptual foundations related to employee well-being, job satisfaction, and organizational performance in Industry 5.0 contexts. Section 3 describes the research methodology, including the systematic search strategy, inclusion/exclusion criteria, quality appraisal procedures, and thematic synthesis procedures, in line with established guidelines for integrative reviews and PRISMA reporting standards. Section 4 presents the results of the integrative analysis, identifying key conceptual patterns, relational dynamics, and contextual contingencies. Section 5 develops the integrative interpretive framework by positioning (HCOE) as an interpretive lens for understanding these dynamics. Section 6 discusses theoretical and practical implications, limitations, and avenues for future research. This article concludes with a summary of the main insights.

2. Theoretical Background

This section reviews the theoretical foundations relevant to employee well-being, job satisfaction, and organizational performance in digitally mediated work systems within the context of Industry 5.0. It first outlines key conceptual perspectives on employee well-being in technology-intensive workplaces. It then examines how prior studies link employee well-being and job satisfaction with organizational performance, highlighting emerging tensions and contextual contingencies in digitally mediated environments. Finally, this section introduces (HCOE) as an interpretive lens for understanding these dynamics in Industry 5.0 work systems.

2.1. Employee Well-Being in Digitally Mediated Work Systems

Employee well-being is a foundational construct in organizational behavior and human resource management and is commonly defined as a multidimensional state reflecting individuals' psychological functioning and subjective experiences at work (Fisher, 2014; Grant et al., 2007). In classical literature, well-being has typically been conceptualized through two complementary perspectives: hedonic well-being, which emphasizes positive affect, subjective satisfaction, and the reduction in strain, and eudaimonic well-being, which focuses on meaning, personal growth, and the realization of individual potential through work. This conceptual distinction forms the basis of many established frameworks in the study of work-related well-being (John-Loh, 2025; Khatun et al., 2022; Kundi et al., 2020).

With the increasing prevalence of digitally mediated work systems such as digital platforms, artificial intelligence applications, and data-driven management practices, traditional conceptions of employee well-being have encountered new conceptual challenges. Prior research suggests that in such environments, well-being is influenced not only by conventional job characteristics but also by how digital technologies are designed, implemented, and governed. From a conceptual perspective, several approaches highlight that digital technologies may simultaneously serve supportive and demanding roles, shaping employees' experiences through the interaction between job demands, available resources, and individual perceptions (Bassi et al., 2025; Ghazy & Fedorova, 2022).

Existing studies further indicate that employee well-being in digitally mediated work systems is contingent upon a range of contextual factors, including digital literacy, perceived transparency and predictability of technology-enabled decisions, perceived control, and organizational leadership and support. As a result, empirical findings related to well-being in technology-intensive settings are often heterogeneous, reflecting variations across organizational contexts and implementation practices; this suggests that employee well-being in digital work environments is context-dependent and cannot be fully understood through uniform or linear assumptions (Bassi et al., 2025; Viljoen et al., 2024; Yang et al., 2024). Together, these perspectives highlight that employee well-being in digitally mediated work systems is conceptualized in diverse and sometimes incompatible ways, complicating efforts to understand how well-being is related to individual and organizational performance in Industry 5.0 contexts.

2.2. Job Satisfaction and Dissatisfaction in Digitally Mediated Work Systems

Job satisfaction and dissatisfaction are central constructs in organizational research, yet their meaning and evaluation become increasingly complex in contemporary work settings. One of the earliest and most cited definitions, proposed by (Brayfield & Rothe, 1951), frames job satisfaction as an individual's overall attitude toward their job, shaped by the extent to which job experiences meet personal needs and expectations, whereas job dissatisfaction refers to negative evaluations arising from perceived strain, unmet expectations, or unfavorable working conditions (Shin & Jeong, 2020). In many classical approaches, satisfaction and dissatisfaction have been treated as opposite ends of a single continuum, an assumption that becomes increasingly problematic when examining employee performance in digitally mediated and Industry 5.0 work systems. However, some conceptual perspectives suggest that job satisfaction and dissatisfaction are not always experienced as simple opposites. Employees may evaluate different aspects of their jobs in distinct ways, such that positive and negative appraisals can coexist (Judge et al., 2017). In this sense, job-related evaluations may be multidimensional, rather than reducible to a purely positive or purely negative overall judgment.

In digitally mediated work systems, this conceptual complexity becomes more salient. Prior research indicates that employees' job-related evaluations in technology-intensive environments are shaped not only by their general psychological states but also by features of digital work design and technology use. Changes in monitoring practices, increased reliance on technology-enabled decision processes, or the reconfiguration of job boundaries may influence how employees assess their work experiences, even when certain aspects of the job continue to be evaluated positively. From this perspective, digital technologies cannot be understood solely as uniformly beneficial or detrimental influences on job-related attitudes. Rather, they may simultaneously introduce opportunities for improved work organization and access to resources while also adding new layers of complexity to employees' work experiences (Sharma et al., 2021; Caiado et al., 2022; Pacheco & Iwaszczenko, 2024; Viljoen et al., 2024). As a result, traditional assumptions regarding the relationship between

working conditions and job-related attitudes warrant careful conceptual reconsideration in digitally mediated contexts.

Overall, these considerations suggest that job satisfaction and dissatisfaction in digitally mediated work systems are best understood as context-dependent and multidimensional evaluations, with important implications for how employee attitudes translate into organizational performance outcomes.

2.3. Industry 5.0 as a Context for Human-Centric Work Systems and Operational Excellence

Industry 5.0 is increasingly understood not as a standalone technological leap but as a contextual shift in the logic of work system design within which employee well-being, job satisfaction, and performance are examined and interpreted. This paradigm emphasizes a move away from purely efficiency-driven approaches toward work systems that are human-centric, sustainable, and resilient, thereby redefining the role of humans in relation to advanced technologies. Within this perspective, technology is not positioned as an end in itself but as part of the organizational context in which employees' work experiences take shape (Ghazy & Fedorova, 2022; Ivanov, 2023; Pacheco & Iwaszczenko, 2024). Against this backdrop, the notion of human-centric work systems becomes particularly salient. Such systems are characterized by an integrated consideration of operational requirements and human considerations in work design. The focus extends to how work is organized, how roles are designed, and how human–technology interactions are structured, underscoring that employees' work experiences are shaped by the managerial logic underpinning the design and implementation of work processes (Alves et al., 2023; Maciaszczyk et al., 2023; Dacre et al., 2024; Solves & Verdu, 2024; Villar et al., 2023).

Within this context, the literature refers to HCOE as a managerial approach aimed at aligning operational efficiency with human considerations in the design and governance of work systems. Rather than being confined to process optimization alone, HCOE entails a rethinking of work design logics, and the organization of employees' work experiences. From this perspective, attention to role definition, task structuring, and the configuration of human–technology interactions become increasingly important. In such settings, human resource management is positioned as an organizational actor involved in shaping work-related policies and supporting human-centric approaches (Carvalho et al., 2019, 2021; Mueller & Mueller, 2020; Sawhney et al., 2020). At this stage, HCOE is not introduced as an explanatory model, but as a recurring interpretive theme in the reviewed literature.

Overall, Industry 5.0, human-centric work systems, and HCOE can be viewed as contextual elements that provide a conceptual basis for understanding employees' work experiences in contemporary organizational settings.

3. Methodological Approach

This study adopts an integrative literature review methodology with a predominantly inductive orientation to synthesize and critically reinterpret theoretical and empirical literature on employee well-being, job satisfaction, and performance outcomes in Industry 5.0 contexts. Integrative reviews are particularly suited to nascent, multidisciplinary, and conceptually fragmented fields, where theoretical perspectives are diverse and empirical findings are heterogeneous, limiting the applicability of traditional data aggregation approaches (Snyder, 2019; Torraco, 2016). This methodological choice is driven by the aim of this study to identify paradoxical dynamics and conceptual fragmentation across the literature, which cannot be adequately captured through quantitative aggregation or effect-size synthesis.

Unlike conventional systematic reviews or meta-analyses that focus on answering narrowly defined questions through strict inclusion criteria and statistical pooling, this

review provides an interpretive and integrative synthesis of existing knowledge. It clarifies higher-order conceptual patterns and paradoxical tensions in human–technology interactions within human-centric digital workplaces without claiming causal modeling or unidirectional relationships.

To ensure transparency and methodological rigor, this review follows PRISMA 2020 reporting standards (Page et al., 2021). Although PRISMA was originally developed for systematic reviews of intervention effects, its structured reporting framework is widely applied in integrative reviews to enhance clarity, reproducibility, and consistency in search, selection, and reporting procedures (Torraco, 2016; Whitemore & Knafl, 2005). The processes of inductive thematic synthesis and framework development are aligned with established approaches for interpretive integrative reviews.

Accordingly, this review follows a rigorous five-stage protocol adapted from integrative review methodologies: (1) problem identification, (2) structured literature search, (3) data evaluation and quality appraisal, (4) inductive data analysis and thematic synthesis, and (5) development of an integrative conceptual framework. This inductive and interpretive approach is deliberately chosen over deductive hypothesis testing to remain sensitive to emergent themes, contradictions, and paradoxical dynamics that characterize the evolving Industry 5.0 literature.

a. Integrative Review Design and PRISMA-Guided Screening

An integrative review design was employed to synthesize and reinterpret fragmented evidence on employee well-being, job satisfaction, performance outcomes, and HCOE in Industry 5.0 contexts. The PRISMA 2020 guidelines were applied to guide the identification, screening, and selection of studies, ensuring transparency and traceability across review stages, rather than serving as an analytical framework.

b. Literature Search Strategy

A comprehensive and structured literature search was conducted in January and February 2025 across four major databases: Scopus, Web of Science (Core Collection), ScienceDirect, and IEEE Xplore. Google Scholar was used solely for forward and backward citation tracking of key papers. Search strings combined four concept blocks using Boolean operators. Table 1 presents the search strategy and example search strings applied across databases. The publication window was set to 2015–2025 to capture the emergence and maturation of Industry 5.0 discourse. Only peer-reviewed journal articles published in English were retained.

c. Inclusion and Exclusion Criteria

Studies were included if they (a) empirically or conceptually examined employee well-being and/or job satisfaction, (b) addressed links to individual or organizational performance outcomes, and (c) were situated within digitally mediated work contexts characterized by advanced technologies (e.g., AI, robotics, digital platforms) and explicitly aligned with Industry 5.0 or human-centric work system perspectives.

Studies were excluded if they focused exclusively on technical or engineering performance without reference to employee-related outcomes, lacked a conceptual or empirical focus on work-related well-being or job attitudes, were not peer-reviewed, or were published in languages other than English.

d. Screening and Selection Process (PRISMA 2020-Compliant)

The screening and selection process followed PRISMA 2020 reporting standards. After deduplication using EndNote and manual verification, titles and abstracts were initially screened by the author to identify potentially relevant studies. To reduce selection bias and enhance procedural rigor, all ambiguous cases during the screening stage were

independently cross-checked by an academic peer, ensuring consistent application of the inclusion and exclusion criteria. Full texts of eligible records were subsequently assessed against the predefined inclusion and exclusion criteria.

Table 1. Search strategy and example strings applied across databases.

Concept Block	Search Terms (with Boolean Operators and Wildcards)	Example Full String (Scopus/Web of Science Syntax)
Industry 5.0 & Technology	"Industry 5.0" OR "Industry 5" OR "human-centric manufactur*" OR "human-machine collaboration*" OR "human-machine collaboration*" OR cobot* OR "collaborative robot*" OR "AI at work" OR "artificial intelligence" workplace OR "digital transformation" OR technostress OR "techno-stress" OR "cognitive augmentation"	("Industry 5.0" OR "Industry 5" OR cobot* OR "human-machine collaboration*")
Employee Well-being	wellbeing OR "well-being" OR "well being" OR "employee well-being" OR "psychological well-being" OR "worker well-being" OR "emotional exhaustion" OR burnout	(wellbeing OR "well-being" OR "employee well-being" OR burnout)
Job (Dis)Satisfaction & Attitudes	"job satisfaction" OR "work satisfaction" OR "employee satisfaction" OR "job dissatisfaction" OR dissatisf* OR "work attitudes" OR "job attitudes" OR "employee engagement"	("job satisfaction" OR dissatisf* OR "work attitudes")
Performance Outcomes	performance OR productivity OR "organizational performance" OR "firm performance" OR "employee performance" OR "operational performance" OR "sustainable performance"	(performance OR productivity OR "organizational performance")
Human-Centric Operational Excellence	"human-centric*" OR "human-centered" OR "human-centric operational excellence" OR HCOE OR "employee involvement" OR "employee participation" OR "employee voice" OR "ethical technology" OR "digital literacy"	("human-centric*" OR HCOE OR "employee participation" OR "ethical technology")
Final Combined String (example used in Scopus & WoS—January 2025)	TITLE-ABS-KEY (("Industry 5.0" OR "Industry 5" OR cobot* OR "human-machine collaboration*") AND (wellbeing OR "well-being" OR burnout) AND ("job satisfaction" OR dissatisf*) AND (performance OR productivity) AND ("human-centric*" OR HCOE OR "employee participation")) AND PUBYEAR > 2014 AND LANGUAGE (English) AND DOCTYPE	

A total of 1462 records were identified across five major databases. Following the removal of 384 duplicates, 1078 records remained for title and abstract screening. Of these, 924 studies were excluded because they focused exclusively on technical or engineering aspects (e.g., Industry 4.0 or AI without a human-centric perspective), did not address employee well-being, job satisfaction, or performance, or lacked alignment with Industry 5.0 or human-centric work system perspectives. This process resulted in 154 full-text articles for eligibility assessment, of which 70 were excluded for not meeting the inclusion criteria (e.g., insufficient empirical or conceptual focus on human-centric Industry 5.0 contexts). The final sample comprised 84 peer-reviewed studies (Figure 1).

e. Quality Appraisal and Rigor

To ensure methodological rigor, quality appraisal was conducted using the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018), which is appropriate for evaluating quantitative, qualitative, and mixed-method studies within integrative reviews. Each included study was assessed against five design-specific criteria aligned with its method-

ological orientation (e.g., appropriateness of data collection and analysis for qualitative studies; sampling strategy and measurement validity for quantitative studies). Studies scoring below 60% on the MMAT were excluded to uphold a minimum threshold of methodological adequacy.

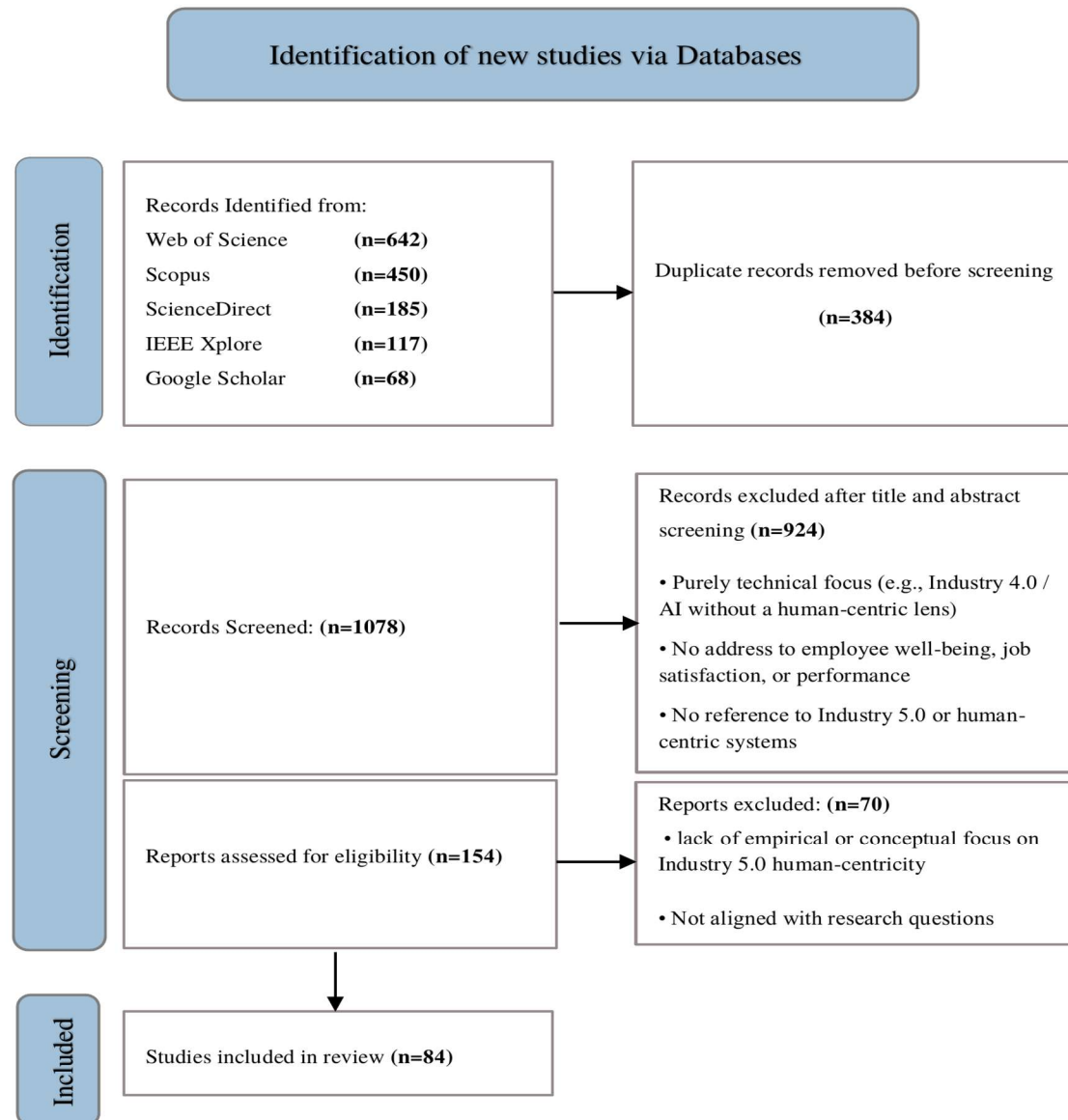


Figure 1. PRISMA diagram of the study selection process.

Formal tools such as AMSTAR 2 were not applied, as integrative reviews prioritize conceptual rigor, interpretive depth, and thematic coherence over standardized quantitative scoring. To enhance appraisal rigor and reduce subjectivity, ambiguous cases during quality assessment and data extraction were independently cross-checked by an academic peer.

Data extraction from all included studies followed a structured template to ensure consistency. Analytical rigor and auditability were further supported through triangulation across theoretical and empirical sources and the use of MAXQDA (version 24) to systematically manage extracted data, document coding decisions, and maintain transparent audit trails throughout the review process (Torraco, 2016; Whittemore & Knafl, 2005).

ining how the literature links employee well-being and job satisfaction to organizational performance and by identifying the contextual conditions shaping these relationships.

Across these themes, a recurring pattern concerns the dual role of advanced digital technologies, which are associated with both positive employee experiences such as enhanced autonomy, personalization, perceived support, and negative experiences, including technostress, cognitive overload, surveillance-related anxiety, and concerns about job displacement. These coexisting dynamics challenge linear assumptions about the relationship between employee well-being, job attitudes, and performance, highlighting non-linear and context-sensitive patterns. The subsections that follow present the twelve analytical themes, supported by illustrative evidence from the reviewed studies and summarized frequency patterns alongside interpretive commentary.

a. Descriptive Summary of Included Studies

The final sample comprised 84 peer-reviewed journal articles and conference papers, supplemented by six grey literature sources (e.g., official European Commission reports and working papers), published between 2015 and 2025. The resulting corpus reflects a multidisciplinary body of scholarship spanning management, organizational behavior, human resource management, and digital transformation, with a particular focus on employee well-being, job satisfaction, and performance in Industry 5.0-related work contexts.

i. Characteristics of Sampled Studies

Table 2 summarizes the characteristics of the peer-reviewed sample ($n = 84$), including publication timing, methodological approach, primary focus, and geographical distribution. The corpus is concentrated in most recent years, reflecting the acceleration of Industry 5.0 scholarship. The reviewed literature employs diverse research designs, including conceptual analyses and qualitative and quantitative empirical studies. In terms of substantive emphasis, a large share of publications focuses on Industry 5.0 human-centricity and paradox-related discussions, while other streams address manufacturing contexts involving cobots and AI systems, as well as HRM and organizational behavior themes. Geographically, the literature is dominated by European settings, followed by contributions from Asia and North America, with a smaller subset adopting multi-regional perspectives.

ii. Initial Thematic Coding Overview

Table 3 presents the most frequent descriptive codes identified across the reviewed studies, reflecting a strong emphasis on employee well-being, job satisfaction, and sustainability within Industry 5.0 contexts, alongside recurrent tensions such as technostress and enabling conditions including resilience and digital literacy. The codes were derived from a systematic analysis of article abstracts, complemented by targeted consultation of selected full-text sections to inform subsequent interpretive synthesis.

Conceptually related codes (e.g., technostress and cognitive load) were treated as analytically distinct to capture different dimensions of employee experience, distinguishing between experienced psychosocial strain and underlying cognitive or ergonomic mechanisms in digitally mediated work systems. Collectively, these descriptive codes provided the empirical foundation for the higher-order analytical themes developed in the following subsections. Importantly, the reviewed studies consistently frame technology as a contextual condition shaping employee experience, rather than as an analytical focus.

b. Reconceptualizing Employee Well-being and Job satisfaction in Industry 5.0 (RQ1)

The synthesized literature consistently challenges traditional linear models of employee well-being and job satisfaction, reconceptualizing these constructs as dynamic, multidimensional, and contextually embedded phenomena within Industry 5.0 work systems. Rather than treating job satisfaction as a single continuum from dissatisfaction to

satisfaction (Judge et al., 2017; Sunn et al., 2024), or well-being as a stable outcome of favorable job characteristics (Fisher, 2014; Grant et al., 2007), the reviewed studies portray employee experiences as shaped by ongoing and often paradoxical human–technology interactions (Ghobakhloo et al., 2025; Parker & Grote, 2022).

Table 2. Characteristics of the included studies.

Category	Subcategory	Number	Percentage (%)
Publication Year	Before 2022	27	32
	2022–2023	19	23
	2024–2025	38	45
Methodological Approach	Conceptual/framework	32	38
	Systematic & scoping reviews	12	14
	Qualitative empirical	18	21
	Quantitative empirical	22	26
Primary Focus	Industry 5.0 human centricity & paradoxes	39	46
	Manufacturing, cobots & AI systems	24	29
	HRM & organizational behavior	21	25
Geographical distribution	European	47	56
	Asia	22	26
	North American	9	11
	Multi-regional	6	7

Table 3. Most frequent descriptive codes in peer-reviewed studies (top 10).

Descriptive Code	Frequency	Percentage of Studies (%)	Key Supporting References
Human-centric/Human-centered approach	63	74.1	(Alves et al., 2023; Nahavandi, 2019; Ghobakhloo et al., 2025; Grosse et al., 2023; Maciaszczyk et al., 2023)
Employee well-being/Workplace well-being	47	55.3	(Antonaci et al., 2024; Rahmi et al., 2025; Bhoir & Sinha, 2024; Ghazy & Fedorova, 2022; Bassi et al., 2025; Guest, 2017; Fisher, 2014)
Sustainability/Sustainable development	36	42.4	(Dacre et al., 2024; Grabowska et al., 2022; Shabur et al., 2025; Villar et al., 2023; Caiado et al., 2022; Hussain et al., 2025)
Performance/Organizational performance	26	30.6	(Ho & Kuvaas, 2020; Kundi et al., 2020; Yang et al., 2024; Gao et al., 2025; Krekel et al., 2019; Salas-Vallina et al., 2021)
Resilience/Resilient systems	22	25.9	(Ivanov, 2023; Ghobakhloo et al., 2025; Villar et al., 2023; Maciaszczyk et al., 2023; Dacre et al., 2024)
Technostress/Digital strain	22	25.9	(Rahmi et al., 2025; M. Wang et al., 2023; Shirish, 2021; Zhang et al., 2022; Supriyadi et al., 2025)
Job satisfaction/Dissatisfaction	18	21.2	(Memon et al., 2023; Judge et al., 2017; Khatun et al., 2022; Sunn et al., 2024; Shin & Jeong, 2020; Yang et al., 2024)
Paradox/Paradoxical effects	14	16.5	(Gao et al., 2025; Loon et al., 2019; X. Wang & Long, 2025)
Digital literacy/ Upskilling/ Training	12	14.1	(Pathak et al., 2024; Oeij et al., 2024; Dehbozorgi et al., 2024; Karbouj et al., 2024)
Cognitive load/ Fatigue/Exhaustion	10	11.8	(Rahmi et al., 2025; Bassi et al., 2025; Supriyadi et al., 2025; M. Wang et al., 2023; Shamsi et al., 2021)

Across the literature, advanced digital technologies are not conceptualized as direct determinants of well-being or job attitudes, but as contextual conditions that simultaneously enable and constrain employee experiences. In this sense, Industry 5.0 technologies are associated with both enhanced autonomy, competence, and meaningfulness, and increased technostress, cognitive strain, and perceived loss of control (Antonaci et al., 2024; Bassi et al., 2025; Rahmi et al., 2025). As a result, employee well-being and job satisfaction emerge as fluid and ambivalent states, rather than stable outcomes of work design.

This reconceptualization provides the analytical foundation for understanding why positive performance outcomes may coexist with employee strain in Industry 5.0 contexts, and why traditional unidirectional assumptions linking well-being, satisfaction, and performance are increasingly questioned. Figure 3 provides a descriptive overview of thematic frequencies associated with RQ1.

(RQ1) Conceptualizations of Employee Well-being and Job (Dis)Satisfaction

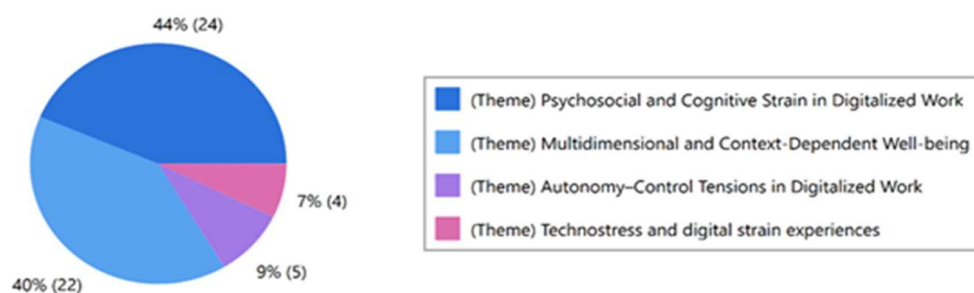


Figure 3. Thematic distribution.

Themes reflect inductively generated categories derived from descriptive coding of the 84 included studies. Frequencies indicate relative prevalence within the corpus and are not intended to represent effect size, causal strength, or theoretical importance.

i. The Role of Meaningful Work

A prominent theme in the reviewed literature is a shift from predominantly hedonic conceptions of well-being focused on positive affect and strain reduction toward more integrated eudaimonic perspectives emphasizing meaning, autonomy, personal growth, and self-realization through work (Diener et al., 2017; John-Loh, 2025). This shift is particularly salient in Industry 5.0 contexts, where humans are repositioned as central actors within socio-technical systems (Grosse et al., 2023; Nahavandi, 2019; Passalacqua et al., 2025).

Meaningful work emerges as a key mechanism underpinning eudaimonic well-being. Studies indicate that when digital technologies support human capability augmentation, skill development, and purposeful contribution rather than mere efficiency, they foster a deeper sense of purpose and fulfillment (Dehbozorgi et al., 2024; Kaasinen et al., 2022; Oeij et al., 2024; Villani et al., 2025).

In such cases, well-being extends beyond transient satisfaction toward more durable forms of engagement and self-realization (Ghazy & Fedorova, 2022; Hussain et al., 2025).

However, this eudaimonic potential is contingent rather than inherent. When technologies are implemented without employee participation, ethical governance, or transparency, they may undermine meaningfulness by intensifying surveillance or reducing autonomy, thereby shifting well-being back toward fragile, affect-based states characterized by strain and dissatisfaction (Grabowska et al., 2022; Pacheco & Iwaszczenko, 2024).

ii. Dimensional Nature of Well-being in Digitally Mediated Work

Beyond the hedonic–eudaimonic distinction, the literature increasingly conceptualizes employee well-being in Industry 5.0 as a multidimensional construct encompassing psychological, social, and cognitive dimensions (Antonaci et al., 2024; Bassi et al., 2025). These dimensions are interdependent and shaped primarily by human-centric implementation practices rather than by technology alone.

Psychological well-being is supported when digital systems enhance autonomy, role clarity, and perceived competence, but is threatened by technostress, digital fatigue, and algorithmic (Rahmi et al., 2025; Supriyadi et al., 2025; M. Wang et al., 2023; X. Wang & Long, 2025). Social well-being depends on how technologies mediate collaboration, trust, and belonging, with inclusive and participatory designs fostering collective efficacy, while isolating or surveillance-oriented systems erode relational quality. Cognitive well-being reflects the balance between cognitive support and overload, with poorly designed systems increasing mental fatigue despite gains in efficiency (Shirish, 2021; Supriyadi et al., 2025).

Taken together, these findings highlight that employee well-being in Industry 5.0 is best understood as a fragile and context-sensitive configuration of psychological, social, and cognitive experiences, requiring holistic and human-centric socio-technical design to avoid trade-offs between efficiency, satisfaction, and sustainable performance.

c. Paradoxical Dynamics in Human–Technology Interaction (RQ1)

The synthesized literature indicates that human–technology interaction in Industry 5.0 is frequently characterized by paradoxical dynamics, whereby advanced technologies simultaneously enable and constrain employees' work experiences rather than producing linear or uniformly positive outcomes (Gao et al., 2025; Parker & Grote, 2022). Technologies such as artificial intelligence, collaborative robots, digital twins, and real-time data systems can enhance human capabilities and support operational performance while also introducing new demands, intensified oversight, and psychosocial strain (Ghobakhloo et al., 2025; Passalacqua et al., 2025).

These tensions challenge deterministic assumptions about technological progress by highlighting outcomes that are contingent on technology design, organizational implementation practices, and governance arrangements (Antonaci et al., 2024; Bassi et al., 2025; Maciaszczyk et al., 2023; Trstenjak et al., 2025a). Rather than consistently improving employee well-being, job satisfaction, or performance, Industry 5.0 technologies are associated with dynamic and often contradictory experiences that employees must navigate in their everyday work contexts (X. Wang & Long, 2025). Accordingly, employee outcomes cannot be understood as inherent effects of technology itself but as emergent consequences shaped by how human-centric principles are enacted in practice.

This analysis shows that the nature of these paradoxical dynamics varies across the specific technological contexts examined in the reviewed studies: in cobot-supported work systems, the dominant tensions concern de-skilling and job security (Grabowska et al., 2022; Zhang et al., 2022). In environments governed by algorithmic management, autonomy erosion and surveillance-related strain prevail (Viljoen et al., 2024; Zhang et al., 2022), and in data-intensive digital work settings, technostress and cognitive overload constitute the primary challenges (Rahmi et al., 2025). Critically, this review reveals that these divergences reflect the uneven progression from efficiency-driven Industry 4.0 logics toward human-centric Industry 5.0 paradigms: technostress and cognitive overload persist as challenges inherited from automation-centered work designs, whereas the autonomy–control and collaboration paradoxes emerge as distinctly Industry 5.0 tensions arising precisely where technologies are intended to augment rather than replace human capabilities (Karbouj et al., 2024; Adel, 2022; Pacheco & Iwaszczenko, 2024). These context-specific patterns are

further moderated by boundary conditions such as digital maturity, the transparency of algorithmic governance, organizational support structures, and the availability of digital literacy and upskilling opportunities (Fraboni et al., 2023; Oeij et al., 2024). These tensions manifest differently in practice depending on the type of organization, firm size, and level of digital maturity, indicating that these dynamics are deeply embedded in real operational conditions. The following subsections examine three recurrent paradoxes identified across the reviewed studies, focusing on their implications for employee well-being, autonomy, and perceptions of job security in technology-intensive work environments.

i. Sources of Technostress and Digital Fatigue.

The reviewed studies identify technostress and digital fatigue as prominent sources of strain in digitally mediated work environments. Technostress is primarily associated with techno-overload, techno-invasion, and techno-complexity, which are linked to emotional exhaustion, burnout, and reduced psychological well-being (Rahmi et al., 2025; Shirish, 2021; Supriyadi et al., 2025; M. Wang et al., 2023; Zhang et al., 2022). These stressors emerge from excessive information flows, constant connectivity, and the increasing complexity of digital tools that employees are required to master. Closely related to technostress, digital fatigue reflects sustained cognitive depletion resulting from prolonged screen exposure, persistent notifications, interaction with complex digital interfaces, and continuous algorithmic monitoring. Empirical evidence shows that such fatigue is particularly prevalent in data-intensive and cobot-supported work systems, where real-time digital interaction is continuous and cognitively demanding (Antonaci et al., 2024; Bassi et al., 2025; Shamsi et al., 2021).

The intensity of technostress and digital fatigue varies substantially across organizational and individual contexts. Limited digital literacy, opaque algorithmic governance, insufficient recovery opportunities, and weak organizational support are associated with more adverse employee experiences and heightened strain (Fraboni et al., 2023; Oeij et al., 2024). In contrast, transparent system design, adaptable digital interfaces, and continuous skill development are reported to moderate technostress and digital fatigue, enabling digital technologies to function as supportive rather than depleting work resources (Grosse et al., 2023; Kaasinen et al., 2022; Villani et al., 2025).

ii. The Autonomy–Control Paradox: Algorithmic Management vs. Employee Agency

The autonomy–control paradox reflects a recurring tension in Industry 5.0 work systems, where digital technologies may simultaneously enhance perceived autonomy while intensifying control through algorithmic management. Empirical evidence indicates that employee agency functions both as an enabler and a constraint, depending on implementation conditions.

On the enabling side, several empirical studies have documented this role (Wood, 2021). In their study of freelance workers on online platforms such as Upwork and Fiverr, the authors found that algorithmic evaluation based on customer feedback, which is collected at the end of the labor process, allows workers to retain discretion over how they perform their tasks (Meijerink & Bondarouk, 2023). Through their conceptual framework of the “duality of algorithmic management,” the authors demonstrated that HRM algorithms simultaneously constrain and enable autonomy and value for workers. For instance, Uber drivers reported that algorithms afforded them freedom in work process choices to maximize earnings (Cameron, 2024). Similarly, Jarrahi et al. (2021), showed that algorithmic systems in conventional organizations provide cognitive support tools that help managers overcome cognitive limitations when dealing with large volumes of data, thereby supporting self-regulation in decision-making. Similar patterns are observed in human–machine teamwork contexts, where AI-supported systems enable adaptive task allocation and real-

time assistance while also creating a dual experience between active control and passive monitoring (Kaasinen et al., 2022).

On the constraining side, empirical evidence has documented the limiting effects in detail. Wood (2021), studying Amazon warehouse workers in Italy and the UK, found that algorithmic management through handheld devices requires workers to maintain approximately one minute per item and dictates their movement routes in real time, with workers frequently having to run to keep pace with algorithmically determined speeds (Delfanti, 2021). Wood (2021), further reported that on platforms such as Uber and Lyft, key information including destination and fare is withheld from drivers, who are given only 12 s to make acceptance decisions, effectively restricting their discretion over task selection (Rosenblat & Stark, 2016). Jarrahi et al. (2021), also found that in Amazon warehouses, algorithms monitor worker performance in terms of speed and in some cases lead to worker demoralization and even physical injuries.

Empirical reports also indicate a dual experience in which workers gain tactical control over immediate task execution while losing strategic influence over role definitions and performance criteria. Meijerink and Bondarouk (2023), showed that workers on the Upwork platform leverage their algorithmically generated reputation scores to attract clients outside the platform, thereby circumventing platform control mechanisms (Kinder & Carolina, 2019) while simultaneously losing influence over broader organizational decisions. Viljoen et al. (2024), in a 12-month case study of a large manufacturing firm, confirmed this duality: upper management viewed digital transformation as an opportunity for initiative and digital thinking, whereas assembly line workers expressed concern that digital technologies would merely feed them instructions and reduce the cognitive challenge of their work.

The reviewed evidence further demonstrates that outcomes are contingent upon implementation conditions, clarifying under what circumstances employee agency serves as an enabler and under what circumstances it serves as a constraint. Employee agency functions as an enabler when participatory design, algorithmic transparency, and employee voice mechanisms are present. This is consistent with evidence showing that participatory approaches to skill development and training strengthen employee agency by aligning workforce capabilities with digital transformation demands (Oeij et al., 2024).

Meijerink and Bondarouk (2023) argued that greater algorithmic transparency (so-called “white-box” algorithms) enables workers to better understand system functioning and leverage it for value creation. Jarrahi et al. (2021), emphasized that explainable AI (XAI) approaches and participatory AI design frameworks can increase worker trust and strengthen genuine empowerment.

Conversely, employee agency functions as a constraint when top-down deployment, limited transparency, and weak digital governance prevail. Wood (2021), demonstrated that algorithmic opacity on platforms such as Uber results in severe information asymmetries, poor remedies, and denial of procedural due process for workers. Viljoen et al. (2024), found that when digital transformation communication is designed top-down without worker participation, organizational tensions of the “belonging” and “learning” types emerge, intensifying worker resistance to change.

Overall, the body of evidence reviewed indicates that employee agency is not a fixed construct but rather context-dependent in nature: under conditions of high transparency, participatory design, and strong digital governance, it functions as an enabler; under conditions of opacity, top-down deployment, and weak governance, it functions as a constraint.

iii. The Collaboration Paradox: Human–Cobot Synergy and Job Security Risks

The reviewed studies describe a collaboration paradox arising from human–cobot interaction, whereby collaborative technologies can simultaneously support skill enrichment and intensify concerns related to de-skilling and job security. When designed to

complement human expertise, cobots are reported to augment human capabilities, reduce physical workload, and enable engagement in higher-order and creative tasks, contributing to enhanced task variety, perceived meaningfulness, and professional role enrichment (Kaasinen et al., 2022; Passalacqua et al., 2025; Trstenjak et al., 2025a; Villani et al., 2025).

Conversely, empirical evidence indicates that poorly configured or highly automated collaboration can narrow skill utilization and reduce opportunities for experiential learning and mastery. Excessive reliance on cobots for cognitive or decision-related tasks is associated with de-skilling trajectories, diminished professional growth, and perceptions of obsolescence (Grabowska et al., 2022; Nahavandi, 2019; Zhang et al., 2022). These dynamics are frequently linked to heightened fears of job displacement and redundancy, even in the absence of immediate workforce reductions, contributing to employee anxiety and resistance (Fraboni et al., 2023; Ivanov, 2023).

The literature further suggests that skill and job security outcomes depend on how human–cobot collaboration is implemented. Approaches that emphasize employee involvement, continuous upskilling, and role development are associated with more positive skill trajectories and reduced perceptions of threat (Antonaci et al., 2024; Dehbozorgi et al., 2024). In contrast, top–down deployment and limited training opportunities tend to reinforce mistrust and disengagement, intensifying concerns about long-term employability (Pacheco & Iwaszczenko, 2024; Viljoen et al., 2024).

Taken together, the specific finding generated by this review is that conceptual fragmentation in the Industry 5.0 literature is not only a matter of inconsistent terminology but reflects deeper differences in how studies frame employee experience. While some studies emphasize technostress, digital fatigue, and cognitive overload, others foreground autonomy, human–technology collaboration, job security, meaningful work, or capability development. This review therefore shows that employee well-being and job satisfaction in Industry 5.0 should be understood as paradoxical, multidimensional, and context-dependent constructs rather than stable or uniformly positive outcomes of digital transformation.

d. Performance Implications of Well-being and Job satisfaction (RQ2)

The reviewed literature demonstrates robust linkages between employee well-being, job satisfaction, and performance outcomes in Industry 5.0 contexts while simultaneously emphasizing that these relationships are non-linear, contingent, and frequently paradoxical rather than uniformly positive or unidirectional (Ho & Kuvaas, 2020; Krekel et al., 2019; Loon et al., 2019). Rather than assuming simple causal pathways whereby enhanced well-being or satisfaction automatically translate into superior performance, studies highlight reciprocal and context-dependent dynamics shaped by technological design, work organization, ethical governance, and human-centric implementation practices (Ghobakhloo et al., 2025; Salas-Vallina et al., 2021; Yang et al., 2024).

Empirical evidence indicates that elevated well-being and job satisfaction can foster creativity, psychological resilience, and sustainable productivity. At the same time, performance gains may coexist with or temporarily arise alongside deteriorating well-being under conditions of intensified effort, algorithmic nudging, short-term incentives, or compensatory cognitive support mechanisms that sustain output while concealing underlying human costs (M. Wang et al., 2023). These patterns caution against linear interpretations of the well-being performance nexus and underscore the importance of examining both enabling and constraining effects concurrently.

Figure 4 summarizes the thematic distribution for RQ2, illustrating how well-being and job satisfaction relate to performance outcomes.

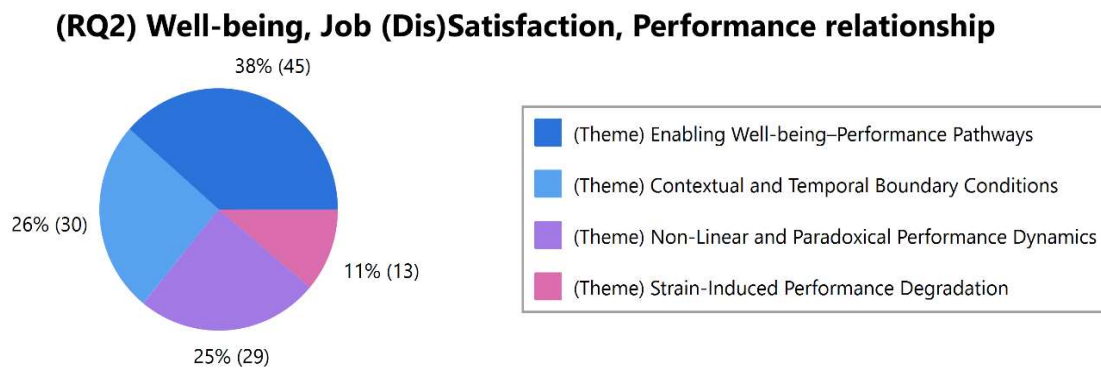


Figure 4. Thematic distribution.

Themes highlight multiple pathways linking well-being and satisfaction to performance across the reviewed literature. Frequencies represent descriptive prevalence within the corpus and should not be interpreted as effect magnitude, causal direction, or normative significance.

i. Individual-Level Outcomes: Creativity, Resilience, and Digital Fluency

At the individual level, higher well-being and job satisfaction are consistently associated with enhanced creativity, psychological resilience, and digital fluency capabilities increasingly critical in technology-augmented and human-centric work systems (Krekel et al., 2019; Oeij et al., 2024; Yang et al., 2024). Meaningful and skill-enriching work experiences support intrinsic motivation, cognitive flexibility, and exploratory behavior, enabling employees to generate innovative solutions and adapt effectively within human–AI and cobot-supported environments (Passalacqua et al., 2025; Trstenjak et al., 2025b). By offloading routine or physically demanding tasks, digital and collaborative technologies may free cognitive resources for higher-order problem-solving, if role clarity, human oversight, and continuous learning opportunities are maintained (Dehbozorgi et al., 2024; Kaasinen et al., 2022; Oeij et al., 2024; Parker & Grote, 2022; Villani et al., 2025).

Psychological resilience further emerges as a key individual-level outcome, with employees reporting higher well-being demonstrating greater adaptability to technological change, role reconfiguration, and fluctuating workloads (Ghobakhloo et al., 2025; Ivanov, 2023; Shamsi et al., 2021). Similarly, digital fluency is strengthened under conditions of low technostress and positive job attitudes, which encourage proactive upskilling, experimentation, and effective engagement with complex digital tools. In contrast, persistent dissatisfaction or unresolved strain undermines these capabilities, contributing to withdrawal behaviors, reduced learning agility, and defensive performance patterns (Supriyadi et al., 2025; Zhang et al., 2022).

ii. Organizational-Level Outcomes: Sustainable Productivity and Social Value

At the organizational level, employee well-being and satisfaction are closely linked to sustainable productivity, operational resilience, and broader social value creation (Ghobakhloo et al., 2025; Villar et al., 2023). Higher well-being is associated with reduced absenteeism, lower turnover intentions, diminished presenteeism, and more stable performance in digitally mediated environments, supporting long-term operational effectiveness beyond short-term efficiency gains (Ho & Kuvaas, 2020; Kundi et al., 2020). Human-centric organizational designs further enable adaptive production systems and resilient supply chains capable of maintaining productivity amid disruption (Grosse et al., 2023; Ivanov, 2023; Shabur et al., 2025).

Beyond productivity, the literature highlights social value outcomes such as ethical innovation, workforce inclusivity, diversity, and alignment with sustainability objectives

(Hussain et al., 2025). Organizations that prioritize employee well-being tend to benefit from enhanced reputation, stakeholder trust, and talent attraction, while neglecting well-being and satisfaction is associated with counterproductive behaviors, reduced organizational citizenship, and erosion of social capital (Caiado et al., 2022; Loon et al., 2019; M. Wang et al., 2023).

iii. Non-Linear and Contingent Relationships: Coexistence of High Performance with Low Well-being

A central insight from the reviewed literature is the non-linear and contingent nature of relationships between employee well-being, job satisfaction, and performance outcomes. Under specific conditions, high performance may coexist with or temporarily emerge from low well-being, challenging assumptions of unidirectional synergy between these (Gao et al., 2025; Ho & Kuvaas, 2020; Loon et al., 2019). Empirical studies indicate that intensified digital demands can sustain short-term productivity through compensatory mechanisms such as heightened individual effort, extrinsic incentives, algorithmic nudging, or temporary cognitive support while simultaneously eroding satisfaction and compromising long-term sustainability (Pathak et al., 2024; M. Wang et al., 2023). The literature further emphasizes that these dynamics are moderated by contextual boundary conditions. Supportive organizational cultures, participatory leadership, digital maturity, and adequate resource availability are associated with more balanced outcomes, whereas opaque algorithmic control, insufficient training, top-down implementation, and limited recovery opportunities exacerbate paradoxical trade-offs between performance and well-being (Fraboni et al., 2023; M. Wang et al., 2023). Collectively, these findings caution against presuming linear or universally beneficial well-being–performance linkages and instead underscore the importance of context-sensitive approaches that explicitly acknowledge and manage persistent tensions between human sustainability and performance demands (Dacre et al., 2024; Ghobakhloo et al., 2025).

Taken together, the reviewed literature indicates that employee well-being and job satisfaction are closely linked to both individual and organizational performance outcomes in Industry 5.0 contexts, including creativity, resilience, sustainable productivity, and social value creation. However, these relationships are not inherently linear or universally positive. This review advances the literature by demonstrating that similar performance outcomes may emerge under fundamentally different employee conditions, ranging from sustainable well-being to hidden strain. Therefore, the well-being–performance nexus in Industry 5.0 is best understood as conditionally structured and context-dependent, shaped by the human-centric quality of technological and organizational implementation rather than by performance outcomes alone.

5. Human-Centric Operational Excellence (HCOE): An Integrative Interpretive Framework

The thematic synthesis reveals persistent paradoxes in employee well-being, job satisfaction, and performance dynamics within Industry 5.0 contexts. Addressing RQ3, this review proposes HCOE as an integrative interpretive lens that synthesizes fragmented insights from the literature into a coherent conceptual structure. Building on the findings generated under RQ1 and RQ2, this review positions HCOE as the interpretive lens that connects conceptual fragmentation with performance contingency. Rather than adopting HCOE from a single prior study, this review develops it as a novel synthesis that explains how human-centric operational practices can manage the paradoxes identified across the literature.

The framework is grounded in established Industry 5.0 principles emphasizing human centricity, ethical responsibility, and socio-technical integration (Ivanov, 2023; Maciaszczyk

et al., 2023; Nahavandi, 2019), and informed by paradox theory, which conceptualizes organizational tensions as persistent and interrelated rather than temporary anomalies to be resolved (Loon et al., 2019; Smith & Lewis, 2011; Stynen & Semeijn, 2023).

Consistent with the reviewed studies, HCOE conceptualizes recurring patterns such as the coexistence of high performance with strain, enhanced autonomy alongside algorithmic control, and collaborative human–technology arrangements accompanied by de-skilling risks as paradoxical conditions embedded in contemporary socio-technical systems (Carvalho et al., 2019; Ghobakhloo et al., 2025; Grosse et al., 2023; Pacheco & Iwaszczenko, 2024). Rather than assuming linear or unidirectional causal relationships, the framework reflects the literature’s emphasis on reciprocal, context-dependent dynamics shaping employee experiences and organizational outcomes.

In line with this perspective, HCOE is positioned as a moderating and interpretive structure through which technology-related tensions may be attenuated, while positive human-centric synergies such as meaningful work, adaptive capacity, and resilience may be reinforced. This framing aligns with prior empirical and conceptual work highlighting that both positive and adverse outcomes can emerge simultaneously in technology-intensive environments, depending on how human-centric principles are enacted in practice. Figure 5 provides a descriptive overview of thematic frequencies for RQ3.

(RQ3) Human-Centric Operational Excellence

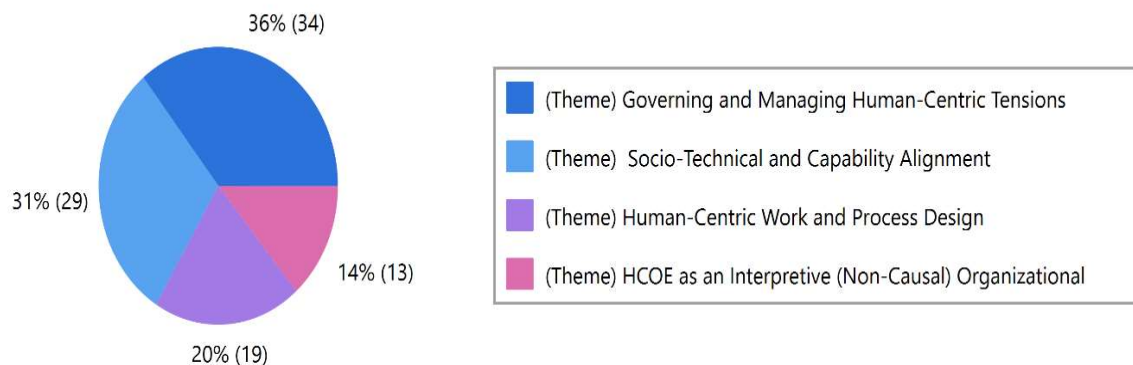


Figure 5. Human-centric operational excellence (HCOE): thematic distribution.

Themes represent higher-order interpretive categories that informed the proposed HCOE framework. Frequencies indicate descriptive salience rather than causal magnitude or normative priority, highlighting recurrent socio-technical and human-centric patterns relevant to RQ3.

The following section consolidates the core dimensions, operating mechanisms, boundary conditions, and conceptual propositions associated with HCOE, providing a structured basis for future theoretical refinement and empirical validation.

a. HCOE: Conceptual Foundations, Core Dimensions, and Operating Conditions

Human-centered operational excellence is conceptualized as a multidimensional managerial philosophy that aligns operational efficiency and resilience with ethical, participatory, and developmental human considerations in socio-technical systems (Dacre et al., 2024; Grosse et al., 2023). In contrast with traditional operational excellence models that emphasize process optimization and cost efficiency, HCOE elevates transparency, employee agency, meaningful work, and ethical technology use as foundational conditions for sustainable performance within Industry 5.0 contexts.

Synthesizing insights from the reviewed literature, the framework encompasses four interrelated dimensions: (1) meaningful work design and job crafting, which enable em-

ployees to shape tasks and roles in ways that enhance purpose, autonomy, and skill development (Ghazy & Fedorova, 2022; Maulidina, 2025; Muttaqin, 2025; Passalacqua et al., 2025); (2) ethical and transparent technology governance, which addresses concerns related to algorithmic opacity, surveillance, and data protection through accountability and explainability mechanisms (Sunarsih, 2025); (3) employee voice, participation, and co-design, fostering shared decision-making and strengthening commitment during technology adoption and use (Bhoir & Sinha, 2024; Maulidina, 2025); and (4) digital literacy and capability development, supporting continuous learning and adaptive engagement with advanced technologies (Carvalho et al., 2019; Ghazy & Fedorova, 2022; Rosca & Stancu, 2024; Pacheco & Iwaszczenko, 2024).

Collectively, these dimensions operate as mutually reinforcing conditions through which HCOE moderates and interprets the paradoxical dynamics identified in literature. By shaping resource-rich work environments and participatory practices, HCOE can attenuate adverse outcomes associated with technostress and digital strain while amplifying positive pathways linking meaningful work and capability development to creativity, resilience, and adaptive performance. The effectiveness of this framework remains contingent on contextual boundary conditions, including organizational culture, leadership commitment, digital infrastructure maturity, task complexity, and workforce characteristics (Carvalho et al., 2019; Oeij et al., 2024; Saeed et al., 2020; Salas-Vallina et al., 2021).

b. Propositions for Future Research

Drawing on the integrative synthesis and the proposed HCOE framework, the following conceptual propositions are advanced to guide future empirical and theoretical inquiry:

Proposition 1. *Higher levels of HCOE are expected to be associated with a weaker negative relationship between technostress and employee well-being.*

Proposition 2. *HCOE may shape the relationship between meaningful work design and individual-level performance outcomes (e.g., creativity and resilience), influencing how these outcomes are realized in technology-intensive contexts.*

Proposition 3. *In organizational contexts characterized by high levels of HCOE, the coexistence of high performance with low employee well-being is expected to be less prevalent.*

Proposition 4. *The ethical governance and employee participation dimensions of HCOE are expected to influence how the autonomy–control paradox is experienced by employees, particularly under conditions of algorithmic management.*

These propositions, grounded in the paradoxical and human-centric patterns identified across the reviewed studies, provide directions for future empirical validation and theoretical refinement while maintaining the framework's context-sensitive and non-causal interpretive orientation.

Taken together, the proposed HCOE framework positions human-centric operational excellence as an interpretive lens through which the complex relationships between employee well-being, job satisfaction, and organizational performance in Industry 5.0 can be understood. By integrating paradox theory with human-centric operational principles, the framework offers a structured way to interpret how socio-technical tensions shape employee experiences and performance outcomes in digitally mediated work systems.

6. Discussion

Building on the thematic synthesis addressing RQ1 and RQ2 and the proposed HCOE framework developed for RQ3, this discussion adopts an integrative and interpretive lens to contextualize the findings without reiterating individual study results, consistent with the aims of integrative reviews (Torraco, 2016; Snyder, 2019). Rather than advancing prescriptive or causal claims, the discussion situates employee well-being, job satisfaction, and performance dynamics within the broader Industry 5.0 paradigm, emphasizing their contingent, paradoxical, and multidimensional nature. In this context, HCOE is positioned as an interpretive framework that supports theoretical coherence in a fragmented and emergent field.

6.1. Integrative Interpretation of the Well-Being–(Dis)Satisfaction–Performance Nexus

The reviewed literature does not converge on a single or unified conceptual explanation of employee well-being, job satisfaction, and performance dynamics within Industry 5.0 contexts. Instead, it reflects a heterogeneous body of research characterized by diverse theoretical perspectives and relational assumptions. Employee well-being is consistently positioned as a central construct, yet its role is portrayed as inherently paradoxical: it is supported by human-centric socio-technical designs that foster meaningful work, autonomy, and cognitive augmentation, while it is simultaneously strained by increased technological complexity, digital overload, and algorithmic control (Bassi et al., 2025; Guest, 2017; Passalacqua et al., 2025).

Job satisfaction and dissatisfaction are similarly depicted as dynamic and potentially coexisting states rather than opposite ends of a linear continuum. Positive job evaluations tend to emerge from empowerment, participatory human–technology collaboration, and perceived contributions to sustainable outcomes, whereas dissatisfaction and ambivalence frequently arise under conditions of intensified technological pressure, even in settings where productivity or operational performance improves (Loon et al., 2019; Yang et al., 2024).

Performance outcomes therefore exhibit non-linear and context-dependent patterns. While enhanced well-being and satisfaction are associated with creativity, resilience, and sustainable productivity, high performance may also coexist with employee strain when short-term compensatory mechanisms obscure longer-term human costs (Gao et al., 2025; Krekel et al., 2019; Ramadan Wardiansyah et al., 2024; Saeed et al., 2020). These findings reinforce the persistence of well-being–performance tensions rather than their resolution under Industry 5.0 conditions.

Within this fragmented landscape, HCOE functions as an integrative interpretive lens that brings coherence to literature without imposing causal assumptions. By foregrounding ethical governance, participatory practices, and meaningful work design, HCOE frames paradoxes as manageable tensions shaped by organizational choices rather than technological inevitabilities. As illustrated in Figure 6, the framework emphasizes bidirectional associations and moderating influences, preserving the contingent and non-causal character of the well-being–performance nexus in Industry 5.0 environments.

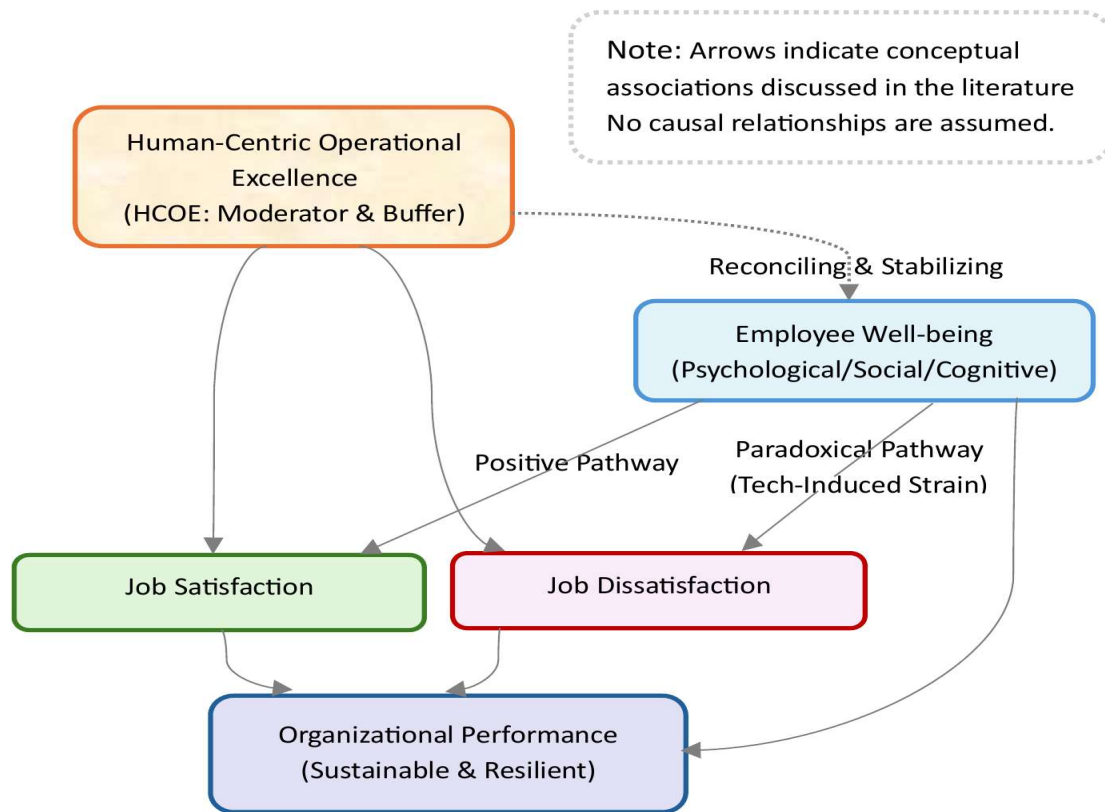


Figure 6. An integrative conceptual framework illustrates the relational dynamics among human-centric operational excellence, employee well-being, job attitudes, and sustainable organizational performance in Industry 5.0 contexts.

6.2. Managerial and Policy Implications

The integrative synthesis and the proposed HCOE framework provide several managerial and policy implications for organizations navigating the paradoxes associated with Industry 5.0 implementation. For managers across human resources, operations, and technology functions, embedding human-centric practices is critical to realizing technological benefits without amplifying employee strain. Participatory co-design processes that incorporate employee voice in technology selection and deployment can help ensure that digital systems augment rather than substitute human capabilities (Grosse et al., 2023). Similarly, ethical technology governance through transparency mechanisms, privacy protections, and explainable AI practices can mitigate surveillance-related anxieties, technostress, and dissatisfaction associated with algorithmic management (Gomaa, 2025; Sawhney et al., 2020).

Continuous investment in digital literacy, upskilling, and resilience-building initiatives further supports employee agency and meaningful engagement with advanced technologies, thereby contributing to sustainable productivity rather than short-term performance gains alone. Managers are also encouraged to monitor paradoxical warning signals such as sustained high output accompanied by rising fatigue or disengagement, and to respond through adaptive work design and recovery-supportive practices to prevent burnout and erosion of long-term performance (Salas-Vallina et al., 2021; M. Wang et al., 2023).

At the policy level, the findings underscore the importance of institutionalizing human-centric priorities within Industry 5.0 strategies. Regulatory bodies and international organizations can support this shift by embedding well-being and ethical governance criteria into innovative policies, funding schemes, and industry standards. Measures such as mandatory socio-technical impact assessments, public-private upskilling initiatives, and

enforceable guidelines for ethical algorithmic management can help ensure that digital transformation advances economic resilience while safeguarding employee well-being and social sustainability (Dacre et al., 2024; Hussain et al., 2025).

6.3. Limitations of the Review

Despite its systematic design and adherence to PRISMA guidelines, this integrative review is subject to several limitations that should be considered when interpreting the findings and the proposed HCOE framework. First, the deliberate focus on peer-reviewed journal articles, conference papers, and selected grey literature published predominantly between 2015 and 2025 may have excluded relevant practitioner reports, industry documents, studies not indexed in the selected databases, or non-English-language contributions. This scope likely constrained geographical and cultural diversity, as the reviewed studies are largely concentrated in European and Asian contexts, limiting broader generalizability.

Second, the emergent and rapidly evolving nature of Industry 5.0 research shaped both the size and composition of the evidence base. A substantial share of the reviewed studies remains conceptual or framework-oriented, with relatively limited longitudinal, experimental, or large-scale quantitative evidence. As a result, the synthesis emphasizes interpretive integration and pattern identification rather than causal inference or effect-size estimation.

Third, although the inductive thematic analysis was supported by structured coding procedures and peer cross-checking to enhance transparency and consistency, interpretive synthesis inherently involves subjective judgment in theme development and framework construction. Such subjectivity is a recognized characteristic of theory-building integrative reviews and may be refined or challenged through future empirical testing and replication.

Finally, this review prioritized transparent inclusion and exclusion criteria over the application of standardized quantitative quality appraisal scores (e.g., full AMSTAR 2 or MMAT thresholds). While appropriate for an integrative rather than meta-analytic approach, this choice limits formal comparisons of evidentiary strength across studies.

Collectively, these limitations highlight opportunities for future research, including systematic meta-analyses as the empirical base expands, multi-method quantitative studies to test and refine the HCOE framework, and cross-cultural, longitudinal investigations incorporating diverse organizational and employee perspectives.

7. Conclusions

This integrative review systematically synthesizes and re-theorizes a fragmented body of literature on employee well-being, job satisfaction, and performance within the emerging paradigm of Industry 5.0. Through a PRISMA-guided synthesis of 84 studies, this review clarifies how these constructs are conceptualized and interconnected in human–technology-mediated work systems. Rather than supporting linear or unidirectional assumptions, the findings reveal dynamic, multidimensional, and frequently paradoxical patterns that challenge traditional models in organizational behavior research.

Central to these insights is the recognition that employee well-being and job attitudes are not static outcomes determined solely by job characteristics, but fluid and context-sensitive states shaped by the dual affordances of advanced technologies, socio-technical design choices, and organizational governance arrangements. Recurrent paradoxes such as simultaneous empowerment and strain, autonomy alongside algorithmic control, and collaborative synergy coupled with de-skilling risks emerge as defining features of Industry 5.0 workplaces, rendering performance outcomes non-linear and contingent rather than uniformly positive.

By advancing HCOE as an interpretive and reconciling lens, this review contributes a coherent framework that integrates dispersed conceptualizations without imposing

untested causal claims. HCOE highlights how ethical governance, employee participation, meaningful work design, and continuous capability development shape the ways organizations navigate persistent tensions between human sustainability and operational performance. In doing so, the framework offers a theoretically grounded yet flexible foundation for understanding human-centric work systems in technologically intensive environments.

At the same time, the conclusions drawn from this review should be interpreted considering the evolving and exploratory nature of Industry 5.0 scholarship and the methodological limitations discussed in Section 6.3. The predominance of conceptual and cross-sectional studies underscores the need for future empirical research to test, refine, and extend the proposed framework across diverse organizational and cultural contexts.

Overall, this study contributes a nuanced and paradox-aware theoretical basis for future research while offering directionally relevant insights for managers and policymakers. As Industry 5.0 continues to evolve, adopting context-sensitive and human-centric approaches grounded in HCOE principles will be critical to realizing the paradigm's transformative potential supporting organizational resilience and performance without compromising employee well-being, dignity, and meaningful contribution.

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Appendix A. Coding Framework Resulting from Inductive Thematic Synthesis

Research Question	Theme	Sub-Theme	Representative Codes	No. of Studies (<i>n</i> = 84)
RQ1	Psychosocial and cognitive strain in digitalized work	Cognitive and emotional strain	Cognitive workload and mental fatigue; psychological strain and emotional exhaustion	21
RQ1	Multidimensional and context-dependent well-being	Conceptual properties of well-being	Multidimensional and context-dependent well-being	20
RQ1	Technostress and digital strain experiences	Digital strain experiences	Technostress; digital strain	22
RQ1	Autonomy–control tensions in digitalized work	Autonomy–control paradox	Autonomy versus control in digitalized work	5

Research Question	Theme	Sub-Theme	Representative Codes	No. of Studies (n = 84)
RQ2	Enabling well-being–performance pathways	Positive and mediated effects	Positive well-being–performance associations; job satisfaction as a mediator of performance outcomes	31
RQ2	Strain-induced performance degradation	Performance erosion mechanisms	Burnout and fatigue undermining performance quality; technostress impairing productivity and decision quality	12
RQ2	Non-linear and paradoxical performance dynamics	Paradoxical coexistence	Non-linear and paradoxical performance effects; performance gains coexisting with employee strain	24
RQ2	Contextual and temporal boundary conditions	Contextual and temporal moderators	Contextual moderators shaping well-being–performance links; short-term efficiency versus long-term human sustainability	27
RQ3	Human-centric work and process design	Human-centered system design	Human-centric work system and process design; meaningful work design; employee participation and voice	19
RQ3	Socio-technical and capability alignment	Human–technology integration	Socio-technical alignment; human–technology collaboration and augmentation logic; continuous capability development and reskilling	18
RQ3	Governing and managing human-centric tensions	Governance and ethical safeguards	Balancing operational efficiency with employee well-being; Ethical governance of advanced digital technologies	27
RQ3	HCOE as an interpretive lens	Non-causal integrative perspective	HCOE as an interpretive (non-causal) organizational lens	13

Across the reviewed corpus, a total of 283 coded segments were identified during open coding, reflecting the analytical richness of the dataset.

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