

The Paradox of Human-Centered Work Design: Work Flexibility, Leadership, and the Line Between Utopia and Pragmatism

Der Fakultät für Wirtschaftswissenschaften der
Universität Paderborn

zur Erlangung des akademischen Grades
Doktor der Wirtschaftswissenschaften
- Doctor rerum politicarum -

vorgelegte Dissertation
von

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geboren am 06. September 1990 in Georgsmarienhütte

Acknowledgments

It has been quite a journey. Writing this dissertation has been an exciting, insightful, and sometimes painful time in my life, during which I have learned a great deal and grown both personally and intellectually. I would like to take this opportunity to express my sincere gratitude to everyone who has accompanied and supported me on this great journey.

First, I would like to express my deepest gratitude to my doctoral supervisor, Professor Dr. Kirsten Thommes, for her tireless support throughout all phases of my doctoral studies and for the trust she has placed in me. As an attentive mentor and important source of inspiration, she has always motivated me greatly and helped me to remain focused in my studies.

I would also like to extend special thanks to Professor Dr. Anja Iseke, Professor Dr. Martin Schneider, and Professor Dr. Michael Ebert for their time and support in reviewing and discussing this dissertation. Their dedication has been instrumental to the success of this project, for which I am deeply grateful.

Special thanks also go to my colleagues at Bielefeld University of Applied Sciences and Arts and OWL University of Applied Sciences and Arts. I am particularly grateful to Professor Dr. Thomas Süße and Dr. Maria Kobert for their unparalleled personal and professional support during this doctoral program. I would also like to thank Professor Dr. Michael Minge and my other colleagues in business psychology for their help and forbearance.

Finally, my greatest thanks go to my family and friends for their tireless encouragement and for the many moments over the years when they provided the necessary balance. My special thanks go to my wife Jennifer and my children Hanna and Kai, who, despite the many sacrifices, always motivated me and reminded me why I embarked on this journey. Thank you all!

Bielefeld, May 2026

Philipp Korte

Contents

Contents	III
List of Papers.....	V
List of Figures	VII
List of Tables	IX
List of Abbreviations	XI
1 Synopsis	1
1.1 Introduction	1
1.2 Conceptual Background and Research Positioning.....	4
1.2.1 Organization 5.0: Promise and Problematization.....	4
1.2.2 Work Design Theory as a Theoretical Lens.....	8
1.2.3 Related Work in Leadership and Organizational Change.....	11
1.3 Research Contribution and Paper Integration.....	15
1.3.1 Overview of the Five Integrated Papers.....	15
1.3.2 Narrative Logic and Integration	21
1.4 Discussion: Toward a Pragmatic Theory of Work Transformation	22
1.4.1 The Promise and Limits of Human-Centered Work Design.....	23
1.4.2 Contributions to Research	26
1.5 Implications for Research, Practice, and Policy	29
1.6 Limitations and Future Directions	31
1.7 Conclusion.....	32
References.....	34
2 Paper 1: Digital Leadership From the Perspective of Organization 5.0: An Analysis of Key Action Fields Towards Green, Resilient, and Human-Centered Digitalization	51

References.....	66
3 Paper 2: Leading Across Time Zones: A Strategic Framework for Leading Virtual Teams in Global Organizations	75
References.....	117
4 Paper 3: Perception of Transformational Leadership and Digital Competence With Varying Degrees of Permanence of Virtual Work: Insights on Work Virtualization During the COVID-19 Lockdown	135
References.....	161
5 Paper 4: Four-Day Workweek – Who Wants to Work Less?	173
References.....	207
6 Paper 5: Educational Pathways for Industry 5.0: Development and Evaluation of a Collaborative Learning Cube Defining Learning Objectives, Curriculum Structure, and Certification Processes Across Different Professional Levels	223
References.....	245

List of Papers

This work is submitted as a cumulative dissertation. Each chapter corresponds to a separate publication, as listed below. Please note that the bibliographic styles of the journals have been retained in the respective chapters, as have the figure and table captions, to match the published versions. The synopsis follows a uniform formatting style.

Paper 1: Korte, P., Kobert, M., & Süße, T. (2024). Digital Leadership from the Perspective of Organization 5.0: An Analysis of Key Action Fields towards Green, Resilient, and Human-centered Digitalization. In L. M. Camarinha-Matos, A. Ortiz, X. Boucher, & A.-M. Barthe-Delanoë (Eds.), *Navigating Unpredictability: Collaborative Networks in Non-linear Worlds* (Vol. 726, pp. 365–379). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-71739-0_24

Paper 2: Korte, P. (2026). Leading across time zones: A strategic framework for leading virtual teams in global organizations. *Strategy & Leadership*, 1–32. <https://doi.org/10.1108/SL-10-2025-0354>

Paper 3: Korte, P., Süße, T., Kobert, M., Kries, C., & Voigt, B. F. (2025). Perception of transformational leadership and digital competence with varying degrees of permanence of virtual work: Insights on work virtualization during the COVID-19 lockdown. *Strategy & Leadership*, 54(1), 1–22. <https://doi.org/10.1108/SL-03-2025-0051>

Paper 4: Korte, P., Gröpper, A., & Thommes, K. (2026). Four-day workweek – Who wants to work less? *Working Papers Dissertations 176*. Paderborn University, Faculty of Business Administration and Economics. <https://ideas.repec.org/p/pdn/disppap/176.html>

Paper 5: Korte, P., Carminati, L., Süße, T., Kobert, M., Cimini, C., Lagorio, A., & Pirola, F. (2025). Educational Pathways for Industry 5.0: Development and Evaluation of a Collaborative Learning Cube Defining Learning Objectives, Curriculum Structure, and Certification Processes Across Different Professional Levels. In L. M. Camarinha-Matos, A. Ortiz, X. Boucher, & A. Lucas Soares (Eds.), *Hybrid Human-AI Collaborative Networks* (Vol. 771, pp. 137–153). Springer Nature Switzerland. https://doi.org/10.1007/978-3-032-05681-8_9

List of Figures

Paper 1

Figure 1: Key action fields of digital leadership in Organization 5.0	64
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Paper 2

Figure 1. Three-Dimensional Model of Team Virtuality	82
Figure 2. Systematic literature search according to the PRISMA flow chart.....	85
Figure 3. Relationship map for the topic of asynchronous leadership	86
Figure 4. Clustered research contributions	87
Figure 5. Integrative model of leadership processes in a digital business environment	90
Figure 6. The Temporal Leadership Framework.....	104

Paper 3

Figure 1. Model on leadership in virtual settings (LiVS model).....	143
Figure 2. Individual Adaptation Process to Virtual Work.....	145
Figure 3. Government restriction measure in Germany, Jan 2020 - Sept 2020.....	151
Figure 4. R output: Optimal number of clusters	154
Figure 5. Cluster profiles	155

Paper 4

Figure 1. Results of the vignette scenarios A–G	189
---	-----

Paper 5

Figure 1. The developed 5.0 Learning Cube.	235
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List of Tables

Paper 2

Table 1. Quality Assessment of Included Studies	88
Table 2. Analysis overview comparing asynchronous and synchronous leadership	103

Paper 3

Table I. Descriptive Statistics	148
Table II. Reliability.....	150
Table III. Frequencies virtual work amount	152
Table IV. Levene-Test.....	153
Table V. Cluster Frequencies	155
Table VI. Results of ANOVA	157

Paper 4

Table 1. Vignette Scenarios	187
Table 2. Results of the logistic regressions for vignette scenarios A-G (overall factor group).....	191
Table 3. Results of linear regressions for the variable wage cut (overall factor group)	194
Table 4. Rating of weekday preferences.....	195
Table 5. Results of linear regressions of free-time activities and overall factor group	199

List of Abbreviations

4DWW	Four-day workweek
AIT	Advanced Information Technologies
COVID-19	Coronavirus Disease 2019
DC	Digital Competence
EQF	European Qualifications Framework
F2F	Face-to-face
HRM	Human Resource Management
ICT	Information and Communication Technologies
JD-R	Job Demands-Resources
LC	(5.0) Learning Cube
TL	Transformational Leadership
TLF	Temporal Leadership Framework
TLI	Transformational Leadership Inventory
VL	Virtual Leadership

Chapter 1

“The basic problem confronting an organization is to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability.”

James G. March

1 Synopsis

1.1 Introduction

In the past two decades, organizational discourse has become increasingly infused with idealistic visions of "better work" (Oldham & Fried, 2016; Parker et al., 2001, 2017; Parker & Grote, 2022; Wegman et al., 2018). From the promise of technological efficiency offered by the dominant Industry 4.0 paradigm (Lasi et al., 2014) to Industry 5.0's vision of human-centered, resilient, and sustainable production, organizational actors and researchers have formulated convincing narratives about the future of work (Van Erp et al., 2024). The European Commission's Industry 5.0 initiative embodies this aspirational framing, placing human well-being, environmental sustainability, and organizational resilience as co-equal drivers of industrial transformation alongside digital innovation (European Commission, Directorate General for Research and Innovation, 2021; Pham & Li, 2026).

Despite its current status as an evolving vision rather than a specified blueprint, the Industry 5.0 approach has achieved substantial institutional momentum (Poltronieri et al., 2025; Xu et al., 2021). At the European level, it informs major research and innovation programs, and the Community of Practice on Industry 5.0, launched in 2023, coordinates more than 240 stakeholders across innovation ecosystems (European Commission, Directorate General for Research and Innovation, 2024). National initiatives such as Italy's "Piano Transizione 5.0", operationalize these priorities through fiscal instruments that link tax credits to digital investment in energy-efficiency improvements and other sustainability indicators (Ministero delle imprese e del Made in Italy, 2024). Parallel work on Industry 5.0 skills highlights

rising expectations that higher education and training systems will deliver digital and transversal competencies aligned with this paradigm (Carminati et al., 2025; Pelaez-Sanchez et al., 2024). More generally, organizational research has long shown that normative templates of “better work” require specification of mechanisms and boundary conditions to explain when they translate into stable practice (Humphrey et al., 2007; Parker et al., 2017). Yet between the articulation of such ideals and their practical realization lies a persistent implementation gap that has been only partially theorized from a work design and institutionalization perspective (Birken et al., 2017, 2023; Parker et al., 2025).

This cumulative dissertation examines the tension between idealistic visions of work transformation and the pragmatic constraints of implementation by focusing on selected structural conditions under which the human-centered aspirations associated with Organization 5.0 may or may not stabilize in organizational practice. Drawing on five conceptual and empirical papers spanning virtual work design, temporal leadership, digital competence development, working time reduction preferences, and organizational capability building, the dissertation argues that the gap between aspiration and realized practice is not merely a matter of execution failures or resource constraints. Rather, it reflects more fundamental structural misalignments between the assumptions embedded in transformation narratives and the actual conditions under which modern work is designed and experienced.

The central argument proceeds as follows. While Industry 5.0 and broader “Organization 5.0” frameworks articulate normatively compelling ideals – placing human well-being at the center of production and requiring organizations to balance efficiency, sustainability, and well-being – empirical evidence from both prior research and the papers in this dissertation suggests that these ideals often encounter systematic implementation difficulties when they meet concrete work design realities, temporal constraints, leadership transmission challenges, and fairness expectations among employees. Meta-analytic studies and reviews on work design show that changes in work structure are associated with significant effects on motivation, well-being, and performance, but also that these effects depend strongly on contextual

configurations and boundary conditions (Humphrey et al., 2007; Oldham & Fried, 2016; Parker et al., 2017). This is not a call to abandon human-centered ideals, but rather an invitation to develop more rigorous, contextually grounded theories of organizational change that acknowledge both the legitimacy of transformative aspirations and the structural barriers to their realization.

Against this backdrop, the central research question guiding this dissertation is: How can organizations move beyond idealized framings of human-centered work design and develop structurally viable models of work transformation under conditions of digitalization, temporal dispersion, and institutional constraint? Building on work design theory and evidence on the context-contingency of work redesign effects (Humphrey et al., 2007; Oldham & Fried, 2016; Parker et al., 2017), this dissertation advances a mechanism-based explanation of why human-centered transformation objectives frequently fail to stabilize as organizational practice. It conceptualizes the implementation gap as structural misalignment between (a) temporal design conditions that shape leadership transmission and learning in virtual work (Brown et al., 2021; Purvanova & Kenda, 2018) and (b) distributive and procedural justice evaluations that shape acceptance of work-time reforms and related reallocations of costs and burdens (Colquitt, 2012; Colquitt et al., 2001). In addition, it argues that sustained transformation depends on capability-building infrastructures that enable actors to recognize and manage persistent goal contradictions, consistent with paradox theory's emphasis on ongoing tension management rather than "resolution" (Smith & Lewis, 2011).

Three dimensions are treated as analytically central in this dissertation, although not exhaustive of all transformation challenges. First, temporal distance and asynchronous work must be recognized as structural constraints on leadership transmission, social interaction, and competence development in virtual work settings, rather than neutral background conditions (Brown et al., 2021; Purvanova & Kenda, 2018). Second, work design, including autonomy, temporal flexibility, and algorithmic control, acts as a crucial moderating force between idealistic leadership visions and individual work experience (Humphrey et al., 2007; Parent-Rochelleau & Parker, 2022; Parker &

Grote, 2022). Third, fairness and cost-sharing mechanisms are indispensable prerequisites for sustainable restructuring of work, as employees evaluate “human-centered” innovations from perspectives such as distributive (outcomes) or procedural justice (process control) (Brockner & Wiesenfeld, 2013; Colquitt, 2012; Colquitt et al., 2001). In line with contemporary literature, the dissertation uses work design as an overarching term that includes classic job design (i.e. the design of individual jobs) as well as broader social and contextual features of work (Humphrey et al., 2007; Oldham & Fried, 2016; Parker & Grote, 2022).

In the following sections, the synopsis (Chapter 1) first establishes the conceptual starting point of the dissertation in Section 1.2. It critically contrasts the human-centered ambitions of Organization 5.0 with current evidence on work design under digitalization and positions a work design perspective, rooted in the job-design tradition, as the primary integrative lens for theorizing work transformation. Section 1.3 explains how the five research studies are interconnected and how they relate to the existing literature, highlighting how temporal constraints, leadership transmission, skill development, and fairness considerations collectively shape the feasibility of human-centered work design. Section 1.4 develops a more pragmatic perspective on work transformation, from which Section 1.5 derives differentiated implications. Section 1.6 outlines limitations and directions for future research, and Section 1.7 concludes. Chapters 2–6 contain the five papers included in the dissertation.

1.2 Conceptual Background and Research Positioning

1.2.1 Organization 5.0: Promise and Problematization

The European Commission's Industry 5.0 framework, formally introduced in 2021, marks a deliberate departure from Industry 4.0's predominantly technology-centric logic (Lasi et al., 2014). Whereas Industry 4.0 emphasizes productivity gains through digitalization and artificial intelligence, Industry 5.0 introduces three co-equal, more value-based pillars: human-centricity, resilience, and sustainability (European Commission, Directorate General for Research and Innovation, 2021; Hassan et al., 2024; Van Erp et al., 2024). In this framing, digitalization ceases to be a primary objective and is instead reframed as an enabler, with the guiding question shifting

from “What can we do with new technologies?” to “What can technology do for us?”—a subtle but significant rhetorical move that purports to return human needs to the center of production logic (Hassan et al., 2024; Lei et al., 2024; Van Erp et al., 2024; Xu et al., 2021). Industry 5.0 and Organization 5.0 imply different levels of analysis and therefore different types of claims. While Industry 5.0 emphasizes the three pillars at the industrial ecosystem level (Xu et al., 2021), the term Organization 5.0 refers to the implementation of these principles in concrete structures, leadership practices, and work design models at the organizational level (Pham & Li, 2026).

This distinction is crucial, as there is no automatic progression from normative industrial visions to viable organizational arrangements; intermediary mechanisms, incentives, and institutional contexts matter greatly (Birken et al., 2017; Kohles et al., 2012; Parker et al., 2017). It is therefore not merely semantic, but analytically consequential: it structures the scope of this dissertation by separating policy-level aspirations from organization-level enactment. Accordingly, this dissertation treats Industry 5.0 as a source of expectations and legitimacy pressures and focuses on the structural conditions under which these aspirations become institutionalized as stable work practices.

Extensive work design research documents that, despite broad consensus on the value of human-centered and sustainable ideals (in the sense of enriched, autonomous and meaningful work), attempts to realize these designs in real organizational settings have produced mixed results and often run up against structural and contextual constraints (Oldham & Fried, 2016; Pacheco & Iwaszczenko, 2024).

First, digital technologies and algorithmic management – understood as the use of data-based systems, artificial intelligence, and algorithms to coordinate, manage, and control employees – have ambiguous effects on work design. Recent reviews stress that automation and algorithms can simultaneously increase and decrease key job resources (e.g. autonomy, use of skills, feedback) and change job demands (e.g. performance monitoring, workload), with complex consequences for well-being and performance (Parent-Rochelleau & Parker, 2022; Parker & Grote, 2022). A growing

number of studies conceptualize algorithms as “work designers” that influence autonomy, task complexity, and performance pressure in ways that depend on design choices and governance regulations rather than being inherently employee-focused (Kellogg et al., 2020; Parent-Rochelleau, 2025; Parent-Rochelleau & Parker, 2022; Röttgen et al., 2024).

Second, research on virtual teams and e-leadership indicates that leadership effectiveness in digitally mediated contexts is strongly moderated by structural factors such as temporal distance, task interdependence, and team size (Cummings et al., 2009; Wong & Berntzen, 2019). Meta-analytic evidence shows that both task- and relationship-oriented leadership behaviors are related to virtual team performance, but that relationship-oriented leadership is particularly sensitive to structural constraints (Brown et al., 2021). Meta-analyses of virtuality and team effectiveness further show that the consequences of virtual collaboration depend on the type of team, study setting, and duration, complicating simplistic assumptions of equivalence between face-to-face and virtual work (Purvanova & Kenda, 2022). Studies conducted during the COVID-19 pandemic underscore that leaders of newly virtualized teams face specific challenges in maintaining trust, cohesion, and informal learning when collaboration becomes both virtual and asynchronous (Al-Ani et al., 2011; Boccoli et al., 2024; Chamakiotis et al., 2021).

Third, new findings on working time reduction suggest that even seemingly paradigmatic “human-centered” interventions are subject to delicate design dependencies. Pilot projects on four-day workweeks (4DWW) in several countries – as documented in large mixed-methods evaluations – report favorable improvements in worker well-being (less burnout, stress, and sick days) and no overall decline in performance when hours are reduced without income loss, provided that implementation is preceded by extensive preparatory restructuring measures (Autonomy, 2023; Backmann et al., 2026; Campbell, 2024; Delaney & Casey, 2022; Fan et al., 2025). These studies emphasize that sectoral conditions, work-process redesign, and explicit cost-sharing arrangements are critical to sustainability; seemingly attractive models can produce work intensification or inequitable

burden-shifting if such design issues remain unresolved (Haraldsson & Kellam, 2021; Walker & Fontinha, 2021).

Taken together, these strands of research indicate that the gap between the ambitious goals of Industry 5.0 and organizational reality is often structurally patterned rather than merely accidental. Digitalization and algorithmic management reshape job demands and resources in ways that are not inherently human-centered (Parent-Rocheleau & Parker, 2022; Parker & Grote, 2022). Leadership in virtual and asynchronous contexts faces structural barriers that make it difficult to communicate people-oriented values (Brown et al., 2021; Chamakiotis et al., 2021). Even where human-centered working time models deliver promising results, they require careful fairness-oriented design and are not easily generalized across sectors or employee groups (Campbell, 2024; Delaney & Casey, 2022; Fan et al., 2025; Walker & Fontinha, 2021). Although organizational research has dealt extensively with digital leadership, virtual work, working time reforms and work design, two mechanism-level gaps remain salient. (1) Temporal distance and asynchronous work are often treated as contextual qualifiers rather than structural design conditions that systematically shape leadership transmission, relational reinforcement, and informal learning in virtual collaboration (Brown et al., 2021; Chamakiotis et al., 2021; Cramton, 2001). (2) Human-centered reforms are frequently discussed in terms of general “acceptance,” while the distributional architecture of change (i.e., the distribution of costs, risks, and increased demands) is less explicitly theorized despite robust evidence that distributive and procedural justice shape employee responses to change (Colquitt, 2012; Colquitt et al., 2001). This dissertation addresses these gaps by integrating temporal design and justice-based assessments into a work design lens to explain when human-centered aspirations become structurally viable.

In light of this, the five papers in this dissertation examine three structural tensions that shape the feasibility of human-centered work design under the conditions of the Organization 5.0 paradigm: (1) the role of temporal distance and temporal permanence in shaping perceptions of leadership and competence development in virtual work, (2) the distributive justice logic through which employees evaluate working time

reduction, and (3) the organizational capability-building required to sustain such transformations over time.

1.2.2 Work Design Theory as a Theoretical Lens

This dissertation draws primarily on work design theory and seeks to situate current phenomena (e.g. digitalization, virtual work, and working-time reforms) within this long tradition. This approach reflects the breadth of contemporary research on work design, which goes beyond traditional task characteristics, incorporates social and contextual aspects of work, and addresses the multilevel influences on the structuring and experience of work (Humphrey et al., 2007; Parker et al., 2017, 2025). Classic job design research, originating from Hackman and Oldham's job characteristics model, identifies five core dimensions shaping employee motivation and well-being: skill variety, task identity, task significance, autonomy, and feedback (Hackman & Oldham, 1976). Over decades, meta-analytic evidence and reviews have confirmed robust associations between these characteristics and outcomes such as job satisfaction, affective commitment, and intrinsic motivation across a broad range of jobs and work contexts (Allan et al., 2019; Carter et al., 2024; Fried & Ferris, 1987; Humphrey et al., 2007; Loher et al., 1985; Mazzetti et al., 2023; Muecke & Iseke, 2019; Oldham & Fried, 2016). At the same time, given today's working conditions, certain limitations of earlier work design frameworks have become apparent; three of these limitations are particularly relevant to this dissertation.

First, while autonomy has long been recognized as important in work design theory, its temporal dimensions (including task timing, pace and synchronicity) remain historically under-specified, although recent research highlights temporal autonomy and temporal structures as central to employee well-being and coordination in flexible and remote work (Boccoli et al., 2022; Leonardi et al., 2024; Shipp & Richardson, 2021; Wegman et al., 2018). The pandemic-accelerated rise of remote work has elevated temporal autonomy and synchronicity to the forefront of employees' daily experiences, with profound implications for leadership effectiveness, team coordination, and psychological well-being (Boccoli et al., 2022; Leonardi et al., 2024; Wang et al., 2021).

Second, classical job design models are largely based on relatively stable work contexts, whereas modern organizations operate under conditions of persistent disruption, rapid digitalization, and competing objectives (efficiency, sustainability, human well-being) that can create tensions rather than natural alignments (Parker & Grote, 2022; Pekaar et al., 2024; Scholze & Hecker, 2023, 2024). Parker and Grote (2022) argue that new technologies can both improve and erode job resources (autonomy, feedback, relational aspects) while altering job demands (e.g., monitoring, complexity), with downstream effects on safety, well-being, and performance. In the context of algorithmic management, algorithms can thus function as “work designers” that change autonomy, task complexity, and performance pressure in a way that, in addition to intended efficiency gains, leads to increased mental stress among employees (Gagné et al., 2022; Parent-Rochelleau & Parker, 2022; Röttgen et al., 2024).

Third, traditional frameworks focused primarily on individual job characteristics while neglecting the distributional and fairness logic that employees apply when evaluating changes in work design (Adams, 1963; Colquitt et al., 2001; Greenberg, 2012). Research on working time reduction and flexible work arrangements shows that workers do not simply respond to isolated changes in autonomy or working hours but evaluate whether benefits and burdens are shared fairly across organizational and societal actors (Colquitt, 2012; Haar & Spell, 2009; Sainz et al., 2023; Thomson et al., 2024; Walker & Fontinha, 2021). The perception of an unfair distribution of costs or resources can undermine support for measures that, at first glance, improve individual job quality (Colquitt, 2012; Sainz et al., 2023).

Contemporary research has broadened focus from job to work design, integrating motivational, social, and contextual characteristics (Humphrey et al., 2007; Morgeson & Humphrey, 2006). Meta-analyses show these explain substantial variance in attitudes (satisfaction, commitment) and behaviors (performance, turnover intentions, organizational citizenship) (Humphrey et al., 2007). Comprehensive reviews further highlight multi-level influences, such as technologies, institutions, employee proactivity, requiring systemic interventions beyond isolated job changes (Knight &

Parker, 2021; Parker et al., 2010, 2017). To address these limitations and integrate work design with broader organizational dynamics, this dissertation draws particularly on the Job Demands–Resources (JD-R) theory (Bakker & Demerouti, 2007, 2017; Demerouti et al., 2001). JD-R theory distinguishes between job demands (aspects of work requiring sustained physical or mental effort) and job resources (aspects that contribute to achieving work goals, reduce demands, or promote growth), and shows specific demand–resource configurations shape burnout, engagement, and performance (Bakker & Demerouti, 2007, 2017). Autonomy, time flexibility, supportive leadership, and learning opportunities are prototypical job resources; workload, time pressure, role ambiguity, and fairness topics are typical demands (Schaufeli & Taris, 2014). Importantly, JD-R theory emphasizes that the same characteristic (e.g., autonomy or flexibility) can function as a resource or demand depending on context and appraisal, and that high demands can be sustainable if balanced by adequate resources (Bakker & Demerouti, 2017; Crawford et al., 2010).

Current research on work autonomy illustrates this ambivalence particularly well. Meta-analytic and longitudinal studies confirm that autonomy is generally associated with higher motivation, engagement, and psychological well-being (Clausen et al., 2022; Humphrey et al., 2007). Yet more recent work shows that abrupt, unsupported, or contextually misaligned increases in autonomy can behave like role stressors, contributing to emotional exhaustion and strain – particularly in already demanding roles (Clinton & Conway, 2025; Stiglbauer & Kovacs, 2018). Muecke's (2024) dissertation clearly synthesizes this literature by demonstrating that different forms of autonomy (decision-making, methodological, and planning autonomy) can have different motivational and stress-related effects, and that the consequences of autonomy depend heavily on contextual resources and demands.

Building on these insights, this dissertation responds to calls for a more integrative perspective that combines:

- **Temporal design:** including temporal autonomy, permanence of virtual work, and temporal synchronicity in leader–follower and team interactions (Boccoli et al., 2022; Kirkman & Mathieu, 2005; Leonardi et al., 2024).
- **Fairness and redistribution logic:** explicit examination of the extent to which changes in work design align with employee expectations regarding the distribution of benefits and burdens (Colquitt, 2012; Colquitt et al., 2001; Greenberg, 1987, 2012).
- **Multivalent goals and JD-R configurations:** viewing human-centered, sustainable, and efficient work not as automatically compatible goals, but as partially conflicting objectives that generate specific demand–resource profiles for different employee groups (Parker & Grote, 2022; Smith & Lewis, 2011; Thornton et al., 2012).

In line with this perspective, temporal configurations of work are treated as shaping the coordination requirements, the perception of autonomy, and social interaction processes (Parker et al., 2017). The perception of distributive and procedural justice is considered to have a decisive influence on how employees accept organizational changes (Colquitt et al., 2001). Organizational transformation inherently involves trade-offs between efficiency, flexibility, and well-being, reflecting competing institutional logics rather than implementation problems (Smith & Lewis, 2011; Thornton et al., 2012). Integrating these dimensions into work-design theory allows for a more structurally grounded understanding of human-centered transformation.

1.2.3 Related Work in Leadership and Organizational Change

While JD-R and work design theory provide the micro-level mechanisms explaining how specific work characteristics affect employee outcomes, the successful implementation of these designs depends profoundly on meso- and macro-level organizational processes (Johns, 2006). Consequently, the dissertation engages with three distinct but intersecting streams within the leadership and organizational change literature: (1) digital leadership and transformation, (2) temporal and virtual team leadership, and (3) organizational justice and change implementation. Across these literatures, prior work has yielded important insights into how leaders can drive

digitalization, virtual collaboration, and change processes, but has so far paid limited attention to work design as an integrating mechanism and to the specific tensions arising in Organization 5.0 contexts (Bauwens & Cortellazzo, 2025; Höddinghaus et al., 2024). The following subsections briefly summarize the current state of knowledge in each area and highlight the specific gaps that motivate the empirical and conceptual contributions of this dissertation.

Digital leadership and transformation. Research on leadership in the digital age has evolved significantly from early conceptualizations of "e-leadership," which primarily focused on the computer-mediated transmission of traditional leadership behaviors (Avolio et al., 2000, 2014). The contemporary "digital leadership" construct encompasses the orchestration of holistic organizational transformations in ways that defend human agency, ethics, and resilience (Q. Lin, 2025; Tigre et al., 2023; Van Wart et al., 2019), and positions leaders to act as cultural architects and strategic visionaries who foster agility and innovation (Cortellazzo et al., 2019; McCarthy et al., 2022; Tigre et al., 2023). Systematic reviews emphasize the necessity of integrating technological fluency with advanced soft skills to drive transformation success (Trenerry et al., 2021). Building on this literature, digital leadership is described as a set of skills related to mindset, behavior, culture, and technology, and its influence on the shaping of digital strategy, work organization, corporate culture, and innovation performance is highlighted (McCarthy et al., 2022; Van Wart et al., 2017). Despite these advancements, a notable limitation in this literature is its predominantly techno-centric and performance-oriented bias (Parker & Grote, 2022). Existing frameworks rarely address the multidimensional, often conflicting demands introduced by the Organization 5.0 paradigm. Drawing on paradox theory (Smith & Lewis, 2011), digital leaders are seldom theorized as proactive "work designers" who must explicitly balance competing institutional logics rather than treating them as naturally aligned (Purvanova & Kenda, 2018). Consequently, there is a theoretical gap regarding how digital leadership must be reconceptualized to actively surface and manage the trade-offs of the 5.0 transformation. Paper 1 of this dissertation responds to this conceptual gap by proposing a view of digital leadership as a framework for

navigating paradoxical tensions between efficiency, sustainability, and human-centered work characteristics, rather than assuming that they are inherently aligned.

Temporal and virtual team leadership. A second relevant stream concerns leadership in virtual and temporally dispersed teams. Research emphasizes that time, temporal distance, and asynchronous interaction fundamentally moderate leadership effectiveness (Al-Ani et al., 2011; Chauvin et al., 2024; Espinosa & Carmel, 2003; Liao, 2017). Grounded in functional leadership theory, meta-analytic evidence robustly demonstrates that both task- and relationship-oriented leadership behaviors remain critical for virtual team performance, though their effectiveness is contingent on structural factors such as team size and task interdependence (Brown et al., 2021; Dulebohn & Hoch, 2017; Liao, 2017). Comprehensive meta-analyses and reviews emphasize that the outcomes of virtual collaboration are highly sensitive to methodological and contextual moderators, cautioning against treating virtuality as a monolithic, undifferentiated phenomenon (Höddinghaus et al., 2024; Purvanova & Kenda, 2018). Leadership research during the Coronavirus Disease 2019 (COVID-19) pandemic further illustrates that leaders of formerly co-located teams who transition into virtual settings must develop new competencies in managing temporal distance, asynchronous workflows, and digital communication to sustain performance and well-being (Chamakiotis et al., 2021). Despite these rigorous insights, significant research gaps persist. While temporal distance and asynchronous workflows are well-documented sources of coordination delay (Chauvin et al., 2024; Cummings et al., 2009; Panteli et al., 2019), leadership theory lacks a granular, mechanism-based understanding of how temporal distance differentially moderates specific leadership domains – e.g., why socio-emotional support might degrade faster than task-coordination under asynchronous conditions (Cortellazzo et al., 2019; Newman et al., 2020). The literature has also largely neglected the temporal permanence of virtual work. Existing studies frequently conflate temporary, crisis-induced remote work, such as the arrangements forced by COVID-19, with deliberately institutionalized, sustainable virtual work designs (Chamakiotis et al., 2021; Galanti et al., 2021; Waizenegger et al., 2020; Wang et al., 2021). To date, little research has been conducted on the extent to which the permanence of virtual structures influences the

development of competencies or the perception of leadership behavior. Paper 2 and Paper 3 systematically examine these dimensions and integrate temporal distance and permanence as central structural variables in research on virtual leadership and digital competence perception.

Organizational justice and change implementation. The third stream anchors work transformation in the realities of implementation science and organizational change. It is well-established that structural interventions, regardless of their normative appeal, frequently fail if they misalign with existing (incentive) structures, power dynamics, or employee fairness evaluations (Birken et al., 2017; Damschroder et al., 2009; Van De Ven & Sun, 2011). Comprehensive meta-analytic work on organizational justice consistently demonstrates that distributive, procedural, interpersonal, and informational justice are each uniquely associated with outcomes such as job satisfaction, commitment, citizenship behavior, and withdrawal (Colquitt, 2012; Colquitt et al., 2001; Rupp et al., 2014). Yet, within the contemporary discourse on employee-focused work redesign (such as shortened workweeks), interventions are frequently framed as universally beneficial, obscuring the inherent reallocation of resources, costs, and workloads (Chung, 2022; Delaney & Casey, 2022; Walker & Fontinha, 2021). Thus, the justice literature currently lacks a nuanced empirical understanding of how employees apply distributive justice heuristics to evaluate the explicit cost sharing mechanisms (e.g. proportional wage reductions) inherent in realistic working-time reduction scenarios (Jauch, 2020; Pfeifer, 2007). Concurrently, while the necessity of new competencies for Organization 5.0 is widely acknowledged, educational and capability-building frameworks rarely address how to equip individuals to navigate these justice-related and value-based paradoxes collaboratively. Without structurally embedding these capabilities, the pursuit of human-centricity risks devolving into rhetorical "humanwashing" rather than driving genuine organizational empowerment (Ghobakhloo et al., 2024; Grabowska et al., 2022). Paper 4 and Paper 5 address these critical gaps by empirically analyzing the fairness boundaries of working-time reductions and by developing an educational artifact designed to build sustained contradiction-management capabilities.

In sum, while the existing literature provides strong foundations for understanding digital transformation, virtual collaboration, and change management, it insufficiently integrates these phenomena through the lens of structural constraints and pragmatic work design. By examining the under-theorized role of paradox management in digital leadership and systematic competence development, the structural impacts of temporal distance and permanence, and the unavoidable function of distributive justice in employee-focused reforms, this work systematically addresses this conceptual gap through the five integrated contributions presented in the following chapter.

1.3 Research Contribution and Paper Integration

1.3.1 Overview of the Five Integrated Papers

This cumulative dissertation integrates five papers that span conceptual development, empirical investigation, and solution-oriented framework building. Each work is anchored in specific theoretical strands and contributes to the overarching research question. Across the papers, the dissertation follows an inference logic that enables a method-sensitive integration of conceptual, empirical, and design-oriented contributions while preserving the evidential and scope limits of each approach (Denzin, 2017).

Paper 1: Digital Leadership from the Perspective of Organization 5.0: An Analysis of Key Action Fields towards Green, Resilient, and Human-centered Digitalization

(Korte, Kobert, & Süße, 2024)

For more than a decade, the predominant narrative surrounding digital transformation was conceptually anchored in efficiency and technological exploitation (Lasi et al., 2014). The emergence of the Organization 5.0 paradigm fundamentally disrupts this consensus. By formally introducing human-centricity, resilience, and sustainability as co-equal strategic pillars alongside digitalization (European Commission, Directorate General for Research and Innovation, 2021; Xu et al., 2021), the framework structurally places modern organizations into an arena of competing institutional logics (Jay, 2013; Pache & Santos, 2010). Maximizing algorithmic efficiency while simultaneously preserving human autonomy is rarely a natural fit – and can be understood as a substantial paradox.

To unpack this tension, this first paper provides an initial conceptual anchor for the dissertation. It builds upon the foundational literature of e-leadership and digital transformation (Avolio et al., 2014; Tigre et al., 2023) and explicitly intersects it with paradox theory (Smith & Lewis, 2011) as well as modern work design perspectives (Parker & Grote, 2022). Methodologically, the study employs a narrative review that synthesizes interdisciplinary literature across sustainability, collaborative organizational networks, and digital transformation. Rather than treating the multi-layered goals of Organization 5.0 as easily compatible, the analysis addresses the critical question of how digital leadership must be reconceptualized to move beyond the technology-centric optimization logic of Industry 4.0 (Ghobakhloo et al., 2024).

A central contribution of the paper is to conceptualize digital leaders as proactive work designers who must explicitly navigate paradoxical tensions to prevent organizational paralysis (Pache & Santos, 2010). By identifying three central action fields: environmentally oriented digitalization, supply chain resilience, and human-machine collaboration, the paper provides a theoretical compass for leadership practice that acknowledges and manages structural contradictions.

Paper 2: Leading Across Time Zones: A Strategic Framework for Virtual Teams in Global Organizations

(Korte, 2026)

While the first paper highlights the normative aspirations of digital leadership, Paper 2 introduces one of the most serious structural boundary conditions of modern work implementation: temporal dispersion. Human-centered work design has often relied heavily on synchronous communication to build relational capital, trust, and a psychologically safe communication climate (Zornoza et al., 2009). Modern global work architectures, however, are increasingly characterized by asynchronous coordination (Chauvin et al., 2024; Cummings et al., 2009).

This paper investigates the friction between digital leadership aspirations and the pragmatic realities of global collaboration. The theoretical background is rigorously rooted in functional leadership theory (Zaccaro et al., 2001) and media richness theory (Daft & Lengel, 1986). This foundation is deliberately complemented by contemporary literature on temporal structures in work design (Shipp & Richardson, 2021) and virtual team dynamics (Brown et al., 2021; Purvanova & Kenda, 2022). Through an integrative review of 82 multidisciplinary studies, the paper systematically maps the mechanisms of asynchronous team coordination.

The core contribution is the development of the Temporal Leadership Framework (TLF). The TLF conceptualizes temporal distance not merely as contextual noise, but as a fundamental boundary condition that reconfigures leadership transmission. The framework suggests a critical behavioral asymmetry: task-oriented leadership behaviors (e.g., explicit goal setting and role clarification) remain relatively robust despite asynchronous delays. Conversely, relationship-oriented behaviors (e.g., socio-emotional support and trust-building) appear more vulnerable, as relational capital erodes without synchronous reinforcement (Zornoza et al., 2009). The paper concludes that effective virtual leadership requires deliberate temporal adaptability to compensate for the loss of synchronous communication.

Paper 3: Perception of transformational leadership and digital competence with varying degrees of permanence of virtual work: Insights on work virtualization during COVID-19 lockdown

(Korte, Süße, Kobert, Kries, & Voigt, 2025)

Building on the temporal perspective introduced in Paper 2, this contribution shifts attention from temporal distance to the permanence of virtual work as a structural feature of work design. The paper is theoretically informed by transformational leadership research (Bass & Riggio, 2006), digital competence frameworks (Vuorikari et al., 2022), and JD-R reasoning (Bakker & Demerouti, 2007), and starts from the observation that pandemic-related virtualization should not be treated as equivalent to institutionalized virtual work arrangements (Wang et al., 2021).

Empirically, the study draws on cross-sectional survey data from 488 professionals in Germany collected during the first COVID-19 lockdown and distinguishes, by means of cluster analysis, between minimal/exceptional, substantial/exceptional, and substantial/sustainable forms of virtualization.

The findings suggest that the mere experience of remote work is less consequential than the temporal continuity of virtual arrangements for reported digital competence and perceptions of transformational leadership. More specifically, employees in substantial/sustainable virtualization settings reported more favorable leadership perceptions and higher self-assessed digital competence than respondents in more temporary, crisis-induced arrangements.

The paper thus identifies temporal permanence as an analytically relevant dimension of work design and adds an important empirical complement to Paper 2's argument that temporal structures are not background conditions but shape the feasibility of human-centered work in virtual settings.

Paper 4: Four-day workweek – Who wants to work less?

(Korte, Gröpper, & Thommes, 2026)

The fourth paper broadens the focus of the dissertation from the dynamics of virtual work to the aspects of explicit fairness and redistribution in the context of human-centered working-time reforms. In contemporary management and policy debates, the structural reduction of working hours – such as the 4DWW mentioned here – is often portrayed as universally beneficial, whereas the empirical evidence on how the associated costs and benefits are distributed remains ambivalent.

The theoretical background draws on organizational justice research (Colquitt, 2012; Colquitt et al., 2001) and classical equity theory (Adams, 1963, 1965). These foundational theories are systematically integrated with recent evaluations of working-time reductions (Autonomy, 2023; Campbell, 2024; Delaney & Casey, 2022; Fan et al., 2025). Empirically, the study is based on a vignette-based online experiment involving 379 employees in Germany, who were repeatedly asked to choose between a standard five-day workweek with 35 hours per week at full pay and seven alternative 4DWW models that differed in terms of weekly working hours and the associated wage reductions. This design explicitly forces participants to navigate high-stakes structural trade-offs, such as varying degrees of wage reduction and workload compression.

The study finds substantial but clearly conditional support for a 4DWW among employees. The results suggest that acceptance is guided by distributive-justice heuristics. On average, respondents in the sample were willing to bear about half of the implementation costs via moderate, proportional wage cuts, while expecting employers to cover the remaining share. Acceptance drops sharply once cost-shifting is perceived as disproportionate, and preferences differ systematically across social groups (e.g., gender, age, employment status), including pronounced preferences for work-free Mondays/Fridays and a strong emphasis on additional leisure as the primary motive. Overall, the study warns that seemingly human-centered working time reforms such as the 4DWW could unintentionally reproduce or even exacerbate existing social inequalities without institutional safeguards.

Paper 5: Educational Pathways for Industry 5.0: Development and Evaluation of a Collaborative Learning Cube Defining Learning Objectives, Curriculum Structure, and Certification Processes Across Different Professional Levels

(Korte, Carminati, Süße, Kobert, Cimini, Lagorio, & Pirola, 2025)

The final paper (Paper 5) deals with building the organizational capabilities needed to sustain the multidimensional transformations discussed in the previous chapters. If Organization 5.0 requires paradoxical leadership skills and rigorous fairness deliberations, organizations must systematically prepare their workforce to navigate this complex reality (Jay, 2013; Smith & Lewis, 2011).

The theoretical design of this work is highly integrative. It is informed by experiential learning theory (Kolb, 2015), the Dreyfus model of skill acquisition (Dreyfus, 2004), and contradiction-based learning (Engeström, 2001; Smith & Lewis, 2011). Furthermore, it is structurally aligned with the European Qualifications Framework (Méhaut & Winch, 2012). Methodologically, the paper employs a rigorous design science approach, developing and validating the framework through iterative, collaborative focus groups and workshops with academic and industry experts.

The core contribution is the "5.0 Learning Cube" (LC). This modular educational framework systematically embeds the 5.0 goals in skills development and utilizes gamification and Open Badge certification across three progressive professional tiers: Beginner, Explorer, and Decision-Maker. Crucially, the framework operationalizes the insight that managing the paradoxes of Organization 5.0 requires more than static knowledge transmission. It necessitates experiential learning environments where future decision-makers actively practice balancing competing institutional goals (Jay, 2013), providing a tangible mechanism to translate normative demands into sustainable organizational practice.

1.3.2 Narrative Logic and Integration

The five papers collectively address the central research question of how organizations can move beyond idealized framings of human-centered work design and develop structurally viable models of work transformation under conditions of digitalization, temporal dispersion, and institutional constraint. The narrative unfolds in three movements, which represent an integrative reading of the five papers rather than a separate empirical test of a single overarching model.

Movement 1: Pragmatic Realities of Human-Centered Interventions (Paper 1 & 4)

Paper 1 situates digital leadership within the Organization 5.0 discourse and argues that digital leaders must actively manage tensions between efficiency, sustainability, and human-centered work design rather than assuming their inherent compatibility (Parker & Grote, 2022). Paper 4 complements this conceptual work with an empirical analysis of 4DWW preferences, demonstrating that even normatively attractive reforms require carefully designed cost-sharing and fairness mechanisms to gain broad and equitable support (Autonomy, 2023; Backmann et al., 2026; Campbell, 2024; Fan et al., 2025). The study suggests that employees appear to use sophisticated fairness heuristics to assess whether interventions genuinely redistribute benefits and burdens in a human-centered manner (Colquitt, 2012). In this sense, working-time reduction functions as a particularly stringent test case of human-centered design under economic constraints. Together, these contributions highlight that human-centered interventions are more likely to stabilize when embedded in realistic work design and justice frameworks.

Movement 2: Temporal and Leadership Challenges in Virtual Work (Paper 2 & 3)

Paper 2 and Paper 3 demonstrate that temporal constraints and asynchronous work create fundamental challenges for leadership transmission and competence development. Paper 2 develops the TLF, theorizing how temporal distance moderates the effectiveness of task- and relationship-oriented leadership in virtual teams (Brown et al., 2021). Paper 3 provides empirical evidence that institutionalized, sustainable

virtual work is associated with more positive perceptions of transformational leadership and higher self-assessed digital competence than temporary crisis-induced virtualization. Together, these papers show that temporal distance and the permanence of virtual work are not neutral context variables but central elements of work design that shape leadership effectiveness and capability development.

Movement 3: Building Organizational Capability for Sustained Transformation (Paper 5)

Finally, Paper 5 addresses the capability gap by proposing the 5.0 LC as an educational framework that translates the triadic goals of Organization 5.0 into concrete learning pathways. It emphasizes that capabilities for 5.0 transformation must be developed through sustained, experiential, and collaborative learning, particularly around managing tensions and contradictions rather than merely acquiring technical skills.

Across these movements, work design, with particular emphasis on temporal structures, autonomy-related features, and fairness mechanisms, emerges as the principal integrative lens through which 5.0-style aspirations either become institutionalized or remain aspirational.

1.4 Discussion: Toward a Pragmatic Theory of Work Transformation

While existing research has established that high-quality work design, characterized by autonomy, skill variety, task significance, and supportive social contexts, is generally associated with beneficial outcomes such as motivation, well-being, and performance (Humphrey et al., 2007; Knight & Parker, 2021; Oldham & Fried, 2016), these findings contrast with the mixed and often disappointing results of actual transformation efforts (Birken et al., 2017; Pacheco & Iwaszczenko, 2024; Parker et al., 2017). Building on this tension, the five papers in this dissertation advance a pragmatic theoretical perspective on work transformation under Organization 5.0. Instead of interpreting the implementation gap between human-centered aspirations and organizational reality as a mere execution error, this perspective conceptualizes it as a structurally recurrent pattern of contemporary work under conditions of

digitalization, temporal dispersion, and institutional constraints, drawing on paradox theory (Smith & Lewis, 2011).

The central claim is that Organization 5.0 should not be understood as a linear progression toward “better work,” but as a persistent process of paradox management in and through work design. Human-centered, sustainable, and resilient work arrangements emerge only where organizations explicitly recognize and govern the tensions between competing institutional logics (e.g., efficiency vs. autonomy, flexibility vs. fairness) instead of assuming their natural alignment (Jay, 2013; Pache & Santos, 2010; Thornton et al., 2012). Across the five papers, three recurrent structural tendencies can be identified that help to explain why transformation narratives often overpromise and underdeliver: Evolutionary Optimism, Overestimation of Individual Agency, and Technological Solutionism. This dissertation contributes to an empirical and conceptual understanding of these trends and identifies work design-related mechanisms for addressing them.

1.4.1 The Promise and Limits of Human-Centered Work Design

Evolutionary Optimism. An initial problematic assumption is that human-centered work will emerge as an inevitable downstream outcome of digital and organizational maturity (Bailey et al., 2022; Van Erp et al., 2024). Within Industry 4.0/5.0 discourses, there is often an implicit optimism that, over time, companies' investments in advanced technologies and the adoption of sustainability language will result in better working conditions as a passive by-product, downplaying the ongoing conflict of objectives between operational efficiency, environmental sustainability, and employee well-being (Kellogg et al., 2020; Pham & Li, 2026; Trittin-Ulbrich et al., 2021). Accordingly, technological innovations and diffuse cultural changes alone do not seem to be sufficient for human-centered outcomes. Work design research suggests that technological change can simultaneously increase and decrease job resources while introducing new demands, so human-centered outcomes depend on deliberate design and governance rather than progress alone (Humphrey et al., 2007; Parker & Grote, 2022). Paper 1 underscores this point by showing that digital transformation can simultaneously expand and reduce core job resources, while at the same time creating new demands, e.g., through algorithmic control and data-driven

monitoring. Institutional perspectives likewise imply that value-based aspirations are unlikely to stabilize when short-term efficiency logics dominate decision environments, making formalized countermeasures and accountability structures consequential (Aust et al., 2020; Besharov & Smith, 2014; Pfeffer, 2010). In this sense, Paper 4 demonstrates that even paradigmatic “human-centered” interventions such as the 4DWW configuration are not self-realizing; they require carefully designed cost-sharing rules and sector-specific arrangements to avoid work intensification or inequitable burden shifting. Together, these findings support a more sober proposition: without explicit institutional stabilizers that tie digital investments and sustainability ambitions to concrete work-design choices and distributive rules, human-centered outcomes remain fragile, context-dependent, and vulnerable to reversal (Birken et al., 2017; Oldham & Fried, 2016; Parker et al., 2017).

Overestimation of Individual Agency. A second potential misconception concerns the tendency to overstate what can be achieved through individual agency – whether on the side of leaders or employees (Avolio et al., 2014; Cortellazzo et al., 2019). Many frameworks assume that inspirational digital leadership, enhanced autonomy, or flexible work are sufficient to mobilize employees as co-architects of transformation, presupposing a degree of discretion that is often incompatible with the structural conditions documented in empirical research (Knight & Parker, 2021; Parker & Grote, 2022). Critical research warns against overestimating individual agency and points to, for example, an “autonomy paradox,” in which unstructured flexibility often leads to increasing demands and a decline in actual control (Mazmanian et al., 2013). Empirical evidence further indicates that employees' capacity for sustained action is fundamentally limited. It cannot be expanded indefinitely through inspirational leadership or ideological framing, as an overreliance on transformational behaviors without institutional support ultimately depletes cognitive resources and induces emotional exhaustion (S.-H. Lin et al., 2019). The contributions of this dissertation also converge on a more constrained view. Paper 2 documents how temporal distance and asynchronous workflows systematically erode leaders' ability to maintain socio-emotional support, even when they are motivated to do so (Brown et al., 2021). Paper 3 shows that employees' digital competencies and

perceptions of transformational leadership depend crucially on the institutional permanence of virtual work arrangements rather than on short-term exposure alone (Wang et al., 2021). In addition, employees evaluate organizational structures using sophisticated fairness standards. As psychological contract theory shows, employees are more likely to withdraw support from arrangements they perceive as structurally exploitative, regardless of how people-centered the ideological terms are formulated (Zhao et al., 2007). Similarly, the findings from Paper 4 suggest that employees carefully evaluate structural reforms, such as the 4DWW, through equity calculations; they will promptly withdraw support if cost sharing mechanisms are perceived as inequitable, thereby limiting the persuasive force of purely rhetorical human-centric framing (Colquitt, 2012; Colquitt et al., 2001; Haar & Spell, 2009). These findings collectively argue against voluntaristic explanations of change: without structurally anchored resources, clear temporal architectures, and credible guarantees of fairness, individual agency alone cannot sustain human-centered work designs (Bakker & Demerouti, 2017; Rupp et al., 2014; Smith & Lewis, 2011).

Technological Solutionism. A third prevalent narrative of organizational transformation often succumbs to technological determinism and misguidedly assumes that digital tools inherently neutralize structural constraints such as temporal distance or coordination complexity, restore diversity in communication, and automatically optimize work design (Gibson & Gibbs, 2006; O’Leary & Cummings, 2007; Parker & Grote, 2022). Much of the popular and managerial discourse frames technologies for remote collaboration, algorithmic scheduling, and digital learning platforms as quasi-automatic enablers of inclusion, flexibility, and empowerment (Cortellazzo et al., 2019; McCarthy et al., 2022). The findings of this dissertation put this optimism into perspective. Leadership research demonstrates that technologies mitigate rather than eliminate these structural constraints (Purvanova & Kenda, 2022). It is emphasized that without explicit governance and job redesign, digitalization risks undermining rather than supporting human-centered outcomes (Brown et al., 2021; Parent-Rocheleau & Parker, 2022). Because no asynchronous platform fully preserves tacit knowledge or the nuance of co-located interaction (Cramton, 2001; Dennis et al., 2008), organizations must design work around these systemic limitations rather than

deferring to software. Paper 2 also demonstrates that information and communication technologies mitigate but do not eliminate the frictions associated with asynchronous and cross-time-zone collaboration; relationship-oriented leadership behaviors, in particular, degrade without intentional temporal structuring (Brown et al., 2021; Chauvin et al., 2024). Paper 3 further indicates that digital tools foster competence development and positive leadership perceptions only where virtual work is stabilized as a durable structural configuration (Chamakiotis et al., 2021; Höddinghaus et al., 2024). Paper 5 highlights that the promised benefits of Industry 5.0 technologies can be realized only when they are embedded in carefully designed educational infrastructures that support contradiction-oriented learning rather than one-off training events (Carminati et al., 2025; Engeström, 2001; Smith & Lewis, 2011). Addressing this imperative, this dissertation argues that pragmatic transformation requires structural job redesign and active leadership, not merely technology adoption (Parker et al., 2017). Together, these insights suggest a more sober proposition: technology becomes human-centering only when embedded in deliberately designed temporal, social, and learning infrastructures; absent such design, it frequently amplifies existing tensions rather than resolving them (Knight & Parker, 2021; Pekaar et al., 2024).

1.4.2 Contributions to Research

Overall, the pragmatic theoretical approach proposed here can best be understood as a context-sensitive mid-range theory, whose scope of application is explicitly bounded by the institutional settings and methodological designs examined in this dissertation. On this basis, the dissertation makes three interrelated contributions that cut across the literatures on work design, digital leadership, virtual collaboration, working-time reforms, and capability-building.

First, the dissertation advances an integrative work design perspective on Organization 5.0. By placing work design, rather than technology or leadership style, at the center of analysis, the dissertation offers an integrative perspective that connects debates on digital leadership (Paper 1 & 2), virtual work and competence development (Paper 3), working-time reforms (Paper 4), and Industry 5.0 capability-building (Paper 5). Across these areas, temporal structures (e.g., temporal distance, permanence of

virtual work), distributive and procedural justice, and demand–resource configurations are conceptualized as the main levers through which human-centered aspirations either stabilize or erode. This responds to calls for multilevel, context-sensitive work-design theorizing and extends JD-R and paradox perspectives to the specific conditions of Organization 5.0 (Bakker & Demerouti, 2007, 2017; Parker & Grote, 2022; Smith & Lewis, 2011).

Second, the dissertation highlights key aspects of contemporary work design. Synthesizing the five papers, the dissertation identifies three design priorities for future research and practice:

- **Temporal design:** This dissertation shows that the temporal structure of work – which encompasses not only the work location (on-site vs. remote) but also the timing, synchrony, and permanence – must be regarded as a key design parameter rather than a background variable in virtual work models. The findings from Paper 2 and Paper 3, combined with meta-analytic evidence, suggest that temporal distance and virtuality interact with leadership behaviors and team processes in systematic ways (Brown et al., 2021; Leonardi et al., 2024; Purvanova & Kenda, 2022). The TLF formalizes how these temporal parameters differentially affect task- and relationship-oriented leadership and, by implication, the viability of human-centered work in globally distributed settings. Sustainable, institutionalized virtual work appears to support more positive perceptions of leadership and competence than temporary, crisis-driven arrangements (Paper 3), underlining the importance of temporal permanence as a crucial work-design parameter.
- **Fairness and redistribution design.** Work redesign that alters hours, autonomy, or workloads must incorporate explicit fairness mechanisms. Paper 4 provides fine-grained evidence on how employees evaluate working-time reductions through distributive-justice lenses, revealing both the willingness to co-finance reforms and the sharp limits of such willingness when cost-sharing is perceived as unbalanced. This interpretation, supported by

relevant meta-analytical evidence, underscores the need to embed any human-centered intervention, whether working-time reforms, autonomy increases, or technology-enabled flexibility, within transparent and collectively negotiated redistribution rules (Colquitt, 2012; Colquitt et al., 2001).

- **Contradiction-based design.** Rather than treating the core objectives of Organization 5.0 (human-centricity, resilience, and environmental sustainability) as automatically compatible, work design should explicitly surface and manage potential tensions among these goals (Smith & Lewis, 2011). Paper 1 therefore consistently conceptualizes digital leadership under Organization 5.0 as the active navigation of tensions between efficiency, sustainability, and human-centricity rather than their presumed harmony (Jay, 2013; Pache & Santos, 2010). Paper 5 operationalizes this insight through the 5.0 LC, which embeds contradiction-oriented learning scenarios into curricula and certification schemes (Carminati et al., 2025). Together, these contributions demonstrate how work designs and learning architectures can be deliberately constructed to surface, rather than suppress, underlying goal conflicts and to train actors in managing them over time.

Third, the dissertation makes methodological and translational contributions by combining conceptual synthesis (Paper 1), integrative review (Paper 2), cross-sectional survey analysis with structural differentiation of virtual work models (Paper 3), vignette experiments on the limits of distributive justice (Paper 4), and design science evaluation of an educational artifact (Paper 5). This strengthens the credibility of the proposed perspective by triangulating across different forms of evidence and contribution types (Denzin, 2017). First, theoretical mechanisms are specified, then empirically tested under realistic boundary conditions, and finally translated into actionable frameworks and tools (TLF, 5.0 LC) that can be used in organizational and educational practice (Graham et al., 2006).

In sum, the discussion argues that human-centered work design in the sense of Organization 5.0 is both more demanding and more conditional than many current narratives suggest. Its realization depends on the deliberate orchestration of temporal structures, fairness architectures, and paradox-oriented capabilities in and through work design. The five papers collectively provide theoretical, empirical, and design-oriented building blocks for such a pragmatic approach to work transformation.

1.5 Implications for Research, Practice, and Policy

The cumulative evidence presented in this dissertation yields several implications. Moving beyond conventional calls for context-sensitivity, these implications advocate for a substantial recalibration of how organizations and researchers approach work transformation.

Implications for Research. The primary implication for organizational research is the necessity of integrating work design theory with implementation science and institutional complexity. While work design research excels at predicting individual-level outcomes of specific job characteristics (Humphrey et al., 2007; Knight & Parker, 2021), it often treats the (multilevel) implementation process as a black box (Parker et al., 2017). Conversely, frameworks like the Consolidated Framework for Implementation Research meticulously map the organizational dynamics of change (Damschroder et al., 2009; Reardon et al., 2025) but lack granular work design constructs. Future research should hybridize these streams to explain how human-centered job characteristics and work-design interventions – including leadership development and technology adoption – survive, mutate, or erode when introduced into complex, highly politicized organizational settings (Birken et al., 2017; Nilsen, 2015). Methodologically and contextually, this requires a twofold change: Firstly, a shift from cross-sectional evaluations to longitudinal tracking of “institutionalization processes” to distinguish between the short-term Hawthorne effects of pilot programs (e.g., 4DWW trials) and the long-term sustainability of work redesigns (Grote & Guest, 2017). Secondly, research must incorporate comparative institutionalism. Since the fairness assessments examined in this dissertation are deeply rooted in the

German context of industrial relations, future studies should use the framework of “Varieties of Capitalism” (Hall & Soskice, 2001). This could help to clarify how the requirements for distributive justice in a worker-oriented labor market within liberal market economies differ from those in coordinated market economies characterized by strong collective bargaining (Doellgast et al., 2018).

Implications for organizational practice. For executives and human resources strategists, this dissertation provides a more cautious perspective on technological solutionism. The findings suggest that work design must be elevated from a reactive operational task to a core strategic capability (Knight & Parker, 2021; Parker & Grote, 2022). First, leaders should shift from managing spatial flexibility to orchestrating temporal design (Leonardi et al., 2024). As the TLF (Paper 2) shows, the use of asynchronous tools without establishing explicit, synchronous relationships is likely to undermine social-emotional cohesion over time (Brown et al., 2021). Second, well-being-oriented interventions should be decoupled from purely ideological messaging and grounded in hard structural guarantees. When implementing systemic changes like working-time reductions or permanent remote work, organizations are encouraged to define explicit cost sharing mechanisms upfront. If employees perceive that the "human-centric" change implicitly shifts economic or cognitive burdens onto them, their support may collapse, triggering withdrawal behaviors (Colquitt, 2012; Zhao et al., 2007). Thus, transformation requires managing the paradoxical tensions between efficiency and well-being openly, rather than hiding them behind corporate rhetoric (Smith & Lewis, 2011).

Implications for policy. For policymakers, the findings challenge the assumption that regulating minimum standards is sufficient to foster Organization 5.0. Instead, policy should actively facilitate the structural capacity for transformation. This involves moving beyond subsidizing purely technological investments (as seen in some national Industry 4.0 programs) toward incentivizing socio-technical redesign (Bailey et al., 2022). For instance, funding schemes should require organizations to demonstrate how digital investments are coupled with job redesign and workforce capability-building – like the logic underlying the 5.0 LC (Paper 5). Furthermore,

labor market policies regulating flexible work or shortened workweeks should acknowledge the heterogeneity of employee preferences and vulnerabilities, ensuring that structural reforms do not inadvertently deepen existing labor market inequalities (Chung, 2022).

1.6 Limitations and Future Directions

While this dissertation develops a pragmatic perspective for work transformation, it operates within methodological and contextual boundaries that outline clear avenues for future inquiry.

First, the empirical foundation of the core studies (Paper 3 and 4) is anchored in the German labor market. This context, characterized by strict working-time legislation, strong codetermination, and a cultural emphasis on formalized fairness, provides an excellent laboratory for studying institutionalized work design. However, it constrains the universal generalizability of the findings (Doellgast et al., 2018). The precise tipping points of distributive justice regarding wage reductions (Paper 4) may fluctuate significantly in economies with weaker safety nets or higher income inequality (Campbell, 2024). Comparative work is needed to test whether the identified mechanisms (e.g., the importance of temporal permanence, distributive-justice evaluations of working-time reduction) hold in other contexts.

Second, the methodological designs inherently limit causal claims regarding long-term adaptation. Paper 3 relies on cross-sectional data captured during a unique historical inflection point (the COVID-19 lockdown). While this design effectively isolated the variance between temporary and permanent virtualization, it captures an acute transition rather than a stabilized equilibrium. Future studies must employ longitudinal, multi-wave designs to observe how the perception of digital leadership and competence evolves as initial enthusiasm or crisis-mode adrenaline wanes, controlling for reciprocal effects between well-being and job resources over time (Lesener et al., 2019).

Third, while the dissertation rigorously measures employee perceptions and preferences (e.g., self-assessed digital competence, fairness evaluations, anticipated support for working-time models), it lacks objective behavioral or performance data. Complementing these with behavioral, performance, and administrative data would provide a more comprehensive picture of the consequences of work-design changes (Fan et al., 2025; Humphrey et al., 2007). Future studies should triangulate such self-reported psychological states with administrative data – such as actual turnover rates, sick leave, or objective productivity metrics – to comprehensively map the demand-resource configurations of Organization 5.0 (Bakker & Demerouti, 2017).

Finally, the conceptual artifacts developed in this work, in particular the TLF (Paper 2) and the 5.0 LC (Paper 5), must be empirically validated in practice. While grounded in exhaustive literature reviews and expert validation, their practical efficacy must be tested through quasi-experimental field interventions to determine how effectively they enable leaders and employees to navigate organizational paradoxes (Knight & Parker, 2021).

1.7 Conclusion

This cumulative dissertation offers a theoretically grounded and pragmatically oriented critique of contemporary narratives of work transformation. As the discourse surrounding Organization 5.0 has gained increasing visibility in European policy and corporate strategy, this work questions the teleological assumption that human-centered, sustainable, and resilient work will emerge more or less automatically from digital maturity. Instead, it argues that these ideals risk remaining rhetorical rather than becoming stable organizational practice if they are pursued without sustained attention to temporal constraints, fairness mechanisms, and institutional continuity (Oldham & Fried, 2016). By positioning work design not as a micro-level operational detail, but as a central integrating mechanism of organizational change, this dissertation seeks to narrow the distance between normative aspiration and lived organizational reality.

It shows that technological tools do not dissolve temporal distance as such (O’Leary & Cummings, 2007), that inspiring leadership alone may not compensate for structurally induced strain and exhaustion (S.-H. Lin et al., 2019), and that employees are unlikely to support human-centered reforms when distributive fairness is not credibly ensured (Colquitt, 2012; Zhao et al., 2007). Across the integrated papers, the dissertation therefore highlights the conditions under which human-centered ambitions may become structurally viable rather than remaining largely aspirational.

Through its five contributions, this research provides conceptual, empirical, and design-oriented building blocks for a more sober and structurally grounded understanding of work transformation. It reframes digital leaders as actors who must navigate paradoxical tensions, identifies temporal distance and temporal permanence as critical dimensions of work design, and emphasizes fairness and continuous capability-building as important preconditions for sustainable transformation.

Overall, the dissertation suggests that human-centered transformation is neither a technological inevitability nor an unattainable utopia. Rather, it is a continuous and demanding task of organizational design that requires aspirations for better work to be anchored in the pragmatic realities of how work is structured, how burdens are distributed, and how human flourishing is institutionally sustained.

“Organizations are not built out of bricks but out of events.”

Karl E. Weick

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