

# Leadership in Remote Work (2020–2027): A Bibliometric Analysis of Keyword Networks, Thematic Evolution, and Emerging Research Frontiers

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## ABSTRACT

*The rapid expansion of remote and hybrid work following the COVID-19 pandemic has substantially transformed leadership research across organizational studies, management, digital transformation, and employee wellbeing scholarship. What initially emerged as a crisis-driven managerial concern centered on virtual coordination and communication has progressively evolved into a broader interdisciplinary field addressing hybrid leadership, psychological safety, digital trust, AI-supported management, employee experience, and algorithmic coordination within technologically mediated workplaces. Despite the growing volume of publications on leadership in remote work environments, the intellectual structure and thematic evolution of this emerging field remain insufficiently synthesized. This study develops a bibliometric analysis of leadership in remote work research between 2020 and May 2027 using Scopus-indexed publications retrieved through a structured search strategy combining leadership-related and remote-work-related terms. Articles, reviews, and conference papers were analyzed using VOSviewer and Biblioshiny (RStudio) in order to examine annual scientific production, co-occurrence keyword networks, co-citation structures, thematic evolution, and emerging conceptual clusters. A total of 2,356 documents from 684 publication sources were included in the analysis. Rather than limiting the study to descriptive bibliometric indicators, the paper adopts an interpretative perspective attentive to conceptual shifts and emerging research frontiers within digitally mediated organizational ecosystems. The findings reveal three interconnected developmental phases. The first phase (2020–2021) was dominated by crisis-response leadership focused on communication, productivity, virtual teams, and work-life balance during pandemic disruption. The second phase (2022–2023) reflected consolidation around hybrid work, employee wellbeing, trust, psychological safety, and organizational resilience. The most recent phase (2024–2027) demonstrates increasing thematic expansion toward AI leadership, inclusive leadership, algorithmic management, digital ethics, sustainability, and employee experience. Co-occurrence network analysis further indicates a gradual transition from operational leadership concerns toward more human-centered and socio-technical governance frameworks. The study argues that leadership in remote work should no longer be interpreted merely as a temporary post-pandemic adaptation. Instead, the field increasingly reflects broader transformations affecting organizational authority, workplace identity, digital governance, and technologically mediated labor systems. By mapping the intellectual evolution of leadership in remote work research, the paper contributes to emerging debates concerning hybrid organizational governance, digital leadership, AI-mediated management, and the future of work.*

**KEYWORDS:** remote work leadership; hybrid work; digital leadership; employee wellbeing; AI leadership; algorithmic management; bibliometric analysis

## 1. INTRODUCTION

The rapid global expansion of remote work during the COVID-19 pandemic generated one of the most abrupt organizational transformations in recent managerial history. Practices that had previously occupied relatively peripheral positions within organizational strategy suddenly became central to institutional continuity across universities, multinational corporations, public

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administration, and digital industries. The pandemic accelerated not only the adoption of remote work technologies, but also broader processes of digital organizational restructuring that had already been developing unevenly before 2020 (Savić, 2020). Leadership scholarship responded quickly to these disruptions, producing an extensive body of research addressing virtual coordination, employee wellbeing, digital communication, organizational resilience, and hybrid governance. Yet the speed of this expansion also produced a fragmented intellectual landscape in which crisis management studies, digital transformation narratives, organizational psychology, and socio-technical governance research increasingly overlap without fully converging conceptually.

Remote work disrupted several assumptions historically embedded within leadership theory. Conventional organizational leadership models frequently presupposed physical co-presence, stable institutional routines, and relatively clear distinctions between managerial oversight and employee autonomy. Earlier telework and virtual team scholarship had already anticipated some of these tensions, particularly regarding distributed coordination, trust formation, and technologically mediated interaction (Bell & Kozlowski, 2002; Malhotra et al., 2007). Nevertheless, the pandemic intensified these dynamics on a global scale. Leadership no longer depended upon visibility in conventional organizational settings, and managerial authority became increasingly mediated through digital infrastructures, communication platforms, and asynchronous coordination systems. Similar transformations had been theorized within earlier e-leadership research examining how leadership evolves within digitally distributed organizational environments (Avolio et al., 2001; Zaccaro & Bader, 2003), though the scale and speed of post-2020 organizational virtualization substantially exceeded earlier expectations.

The transition toward remote and hybrid organizational systems also revealed contradictory dynamics concerning flexibility, autonomy, productivity, and employee wellbeing. Some organizational narratives framed remote work as emancipatory, emphasizing flexibility, reduced commuting, and adaptive work structures. Earlier studies had indeed associated remote professional work with increased autonomy and perceived productivity under favorable organizational conditions (Baker et al., 2007). Yet other studies increasingly documented emotional fatigue, social isolation, communication fragmentation, cognitive overload, and blurred boundaries between professional and private life (Wang et al., 2021). The remote workplace became simultaneously associated with empowerment and exhaustion. Leadership under such conditions could no longer rely solely upon operational coordination or performance monitoring. Instead, trust, emotional regulation, psychological safety, and organizational belonging became progressively central concerns.

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These developments unfolded alongside broader transformations associated with digital acceleration, platformization, and AI-supported organizational systems. Earlier telework research had already suggested that digital infrastructures would gradually reshape organizational communication and managerial oversight beyond conventional office environments (Messenger & Gschwind, 2016). More recent scholarship extends this argument further by examining how algorithmic systems, digital exhaust, employee analytics, and AI-supported coordination increasingly shape organizational governance itself (Leonardi, 2021). Leadership in remote work environments therefore appears progressively connected not only to interpersonal influence, but also to the governance of socio-technical systems where authority becomes partially distributed across human actors, technological infrastructures, and automated decision architectures.

At the same time, the field remains conceptually unstable. Remote leadership research intersects with organizational behavior, human resource management, digital transformation, organizational psychology, information systems, and AI governance studies. Similar phenomena are often interpreted through divergent conceptual vocabularies depending on disciplinary orientation. Questions concerning surveillance, employee wellbeing, flexibility, autonomy, and organizational resilience are frequently framed differently across managerial, psychological, technological, and critical organizational perspectives. This fragmentation reflects not merely disciplinary diversity, but broader uncertainty regarding the future trajectory of work itself.

Although publications related to remote leadership expanded rapidly after 2020, relatively limited attention has been devoted to mapping the intellectual structure and thematic evolution of the field across different post-pandemic phases. Existing reviews often focus on isolated dimensions such as virtual communication, employee wellbeing, or hybrid work without fully tracing how leadership research itself transformed conceptually during this period. Moreover, bibliometric analyses examining leadership in remote work environments remain comparatively scarce, particularly studies capable of identifying emerging research frontiers related to AI leadership, algorithmic governance, digital ethics, and technologically mediated organizational systems.

The present study addresses this problem through a bibliometric analysis of leadership in remote work research between 2020 and May 2027 using Scopus-indexed publications analyzed through VOSviewer and Biblioshiny. Rather than approaching bibliometric analysis as a purely quantitative exercise focused exclusively on publication metrics, the study adopts an interpretative perspective attentive to thematic evolution, conceptual fragmentation, and emerging intellectual trajectories. Particular attention is devoted to understanding how leadership research evolved from crisis-response management toward broader concerns

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involving hybrid governance, employee wellbeing, AI-supported coordination, digital ethics, and socio-technical organizational ecosystems.

The study also proceeds from a broader assumption that leadership scholarship increasingly functions as a diagnostic field through which wider societal transformations become visible. The evolution of remote work leadership research therefore reflects more than managerial adaptation alone. It reveals changing understandings of authority, organizational belonging, technological mediation, and human interaction within increasingly hybridized digital societies. In this sense, leadership in remote work may represent not a temporary managerial specialization, but an emerging framework for understanding how organizational life itself is being reconfigured under conditions of digital acceleration and post-pandemic institutional transformation.

### **2 LITERATURE REVIEW**

Leadership research associated with remote work emerged initially from two partially independent intellectual traditions that only became fully interconnected during the COVID-19 period. The first tradition originated within virtual team and telework research, where scholars examined how geographically dispersed collaboration reshaped communication, trust, supervision, and organizational coordination (Bell & Kozlowski, 2002; Malhotra et al., 2007). The second tradition developed around digital leadership and e-leadership studies concerned with the implications of advanced communication technologies for managerial authority and organizational interaction (Avolio et al., 2001; Zaccaro & Bader, 2003). Prior to 2020, these research streams remained comparatively specialized and often peripheral within mainstream leadership scholarship. Remote work itself was generally treated as supplementary organizational flexibility rather than as a dominant institutional structure.

The pandemic altered this position dramatically. Leadership suddenly became inseparable from digital mediation, virtual communication, and technologically supported coordination. Early pandemic literature frequently framed remote leadership through emergency adaptation narratives emphasizing organizational continuity, employee productivity, and communication efficiency under crisis conditions (Contreras et al., 2020; Dirani et al., 2020). In many of these studies, leadership functioned primarily as a stabilizing mechanism intended to reduce uncertainty and preserve operational performance during institutional disruption. The urgency of the moment shaped both research priorities and conceptual framing. Remote work was often interpreted less as a structural transformation than as an exceptional managerial challenge requiring rapid technological and organizational adaptation.

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Yet the literature quickly revealed tensions embedded within this apparently functional transition. While some studies emphasized flexibility, adaptability, and digital efficiency gains associated with remote work, others documented increased stress, emotional exhaustion, social isolation, and communication fragmentation (Gómez et al., 2022; Wang et al., 2021). The relationship between autonomy and wellbeing became particularly ambiguous. Earlier telework studies had suggested that remote work could enhance employee satisfaction when supported by trust, flexibility, and work-life balance (Baker et al., 2007; Schall, 2019). However, pandemic-era remote work frequently occurred under conditions of uncertainty, domestic instability, prolonged digital exposure, and blurred personal-professional boundaries, complicating earlier assumptions regarding flexibility as an inherently positive organizational outcome.

This contradiction significantly influenced the evolution of leadership research after 2021. Leadership gradually shifted from being interpreted primarily through productivity maintenance toward broader concerns involving psychological safety, organizational belonging, emotional sustainability, and employee wellbeing. The literature increasingly recognized that technologically mediated organizations require forms of leadership capable not only of coordinating work processes but also of maintaining trust, cohesion, and legitimacy within fragmented digital environments. Kniffin et al. (2021), for example, argued that remote organizational systems generate complex psychological and social consequences extending far beyond operational logistics. Leadership under such conditions becomes relational and emotional as much as managerial.

The normalization of hybrid work environments further destabilized conventional leadership assumptions. Traditional leadership theories often presupposed relatively stable organizational spaces where managerial authority was reinforced through direct interaction, observable routines, and physical co-presence. Hybrid systems complicated these foundations substantially. Employees increasingly operated across multiple organizational spaces simultaneously - digital, physical, domestic, and mobile—while leadership itself became partially embedded within communication infrastructures, digital platforms, and algorithmic coordination systems. Earlier virtual team research had already emphasized the importance of trust, distributed collaboration, and communication quality within technologically mediated teams (Ford et al., 2017; Gilson et al., 2015), but hybrid organizational structures intensified these dynamics across entire institutional ecosystems rather than isolated project teams.

The concept of digital leadership consequently expanded beyond its earlier technological orientation. Initially, e-leadership scholarship focused primarily on how communication technologies mediate leadership processes and organizational interaction (Avolio et al., 2001). More recent studies increasingly connect digital leadership to organizational resilience, adaptive

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governance, inclusion, digital ethics, employee analytics, and AI-supported managerial systems. Leadership in remote work environments therefore appears progressively less centered upon individual managerial traits and more associated with the governance of socio-technical systems where organizational authority becomes distributed across human actors, digital infrastructures, and automated organizational processes.

This transformation is particularly visible within emerging discussions surrounding algorithmic management and AI-supported organizational coordination. Leonardi (2021) argues that remote organizational environments increasingly generate “digital exhaust” through communication traces, behavioral data, and platform interactions capable of reshaping managerial oversight and organizational visibility. Leadership under such conditions may become partially automated, with decision-making processes increasingly influenced by predictive systems, employee analytics, and AI-supported coordination tools. Some studies frame these developments positively, emphasizing efficiency, personalization, and adaptive organizational intelligence (Vijesh et al., 2025). Others adopt a more critical perspective, highlighting surveillance, diminished autonomy, emotional fatigue, and intensified performance monitoring within digitally mediated workplaces.

The literature also reveals growing conceptual fragmentation. Remote work leadership now intersects with organizational psychology, information systems, digital governance, human resource management, and critical organizational studies. Similar phenomena are often described through divergent theoretical vocabularies depending on disciplinary orientation. For instance, digital monitoring may be interpreted simultaneously as productivity optimization, behavioral analytics, organizational transparency, or workplace surveillance. This fragmentation complicates theoretical consolidation, though it also reflects the interdisciplinary complexity of remote organizational systems themselves.

Another notable development concerns the gradual decline of explicitly pandemic-centered research narratives after 2022. Earlier scholarship focused heavily on crisis communication, emergency coordination, and organizational adaptation during lockdown conditions (Waizenegger et al., 2020; Enachescu, 2025). More recent studies increasingly approach hybrid work as a stable organizational paradigm rather than a temporary disruption. Leadership research correspondingly shifted toward long-term organizational sustainability, employee experience, digital culture, inclusion, and adaptive governance. Purvanova and Kenda (2022), for example, emphasize the growing importance of paradoxical leadership approaches capable of balancing autonomy and control, flexibility and coordination, emotional support and organizational accountability within virtual environments.

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Despite the rapid expansion of scholarship related to remote leadership, several limitations remain visible within the literature. Existing reviews frequently focus on isolated thematic dimensions such as wellbeing, communication, or hybrid collaboration without examining how the intellectual structure of the field itself evolved across different post-pandemic phases. Bibliometric analyses remain comparatively limited, particularly those capable of mapping conceptual clusters, thematic convergence, and emerging research frontiers involving AI governance, digital ethics, employee experience, and algorithmic organizational systems. Moreover, much of the literature remains strongly managerial in orientation, often privileging organizational efficiency and adaptation while paying comparatively less attention to broader transformations affecting authority, labor, organizational identity, and technological mediation.

The present study responds to these limitations by approaching leadership in remote work as an evolving intellectual ecosystem rather than a fixed managerial category. Through bibliometric mapping and thematic analysis, the research seeks to identify not only dominant conceptual clusters but also the deeper transformations affecting leadership scholarship under conditions of digital acceleration, hybrid organizational restructuring, and increasingly technologically mediated work environments.

### **3 METHODOLOGY**

The present study adopts a bibliometric and science-mapping methodology designed to examine the intellectual evolution of leadership research in remote and hybrid work environments between January 2020 and May 2027. The methodological choice reflects a broader concern that the accelerated growth of post-pandemic organizational research has generated conceptual expansion without equivalent synthesis. Leadership scholarship associated with remote work now spans organizational behavior, digital transformation, organizational psychology, information systems, employee wellbeing, AI governance, and hybrid organizational theory, producing an increasingly fragmented yet intellectually dynamic field. Under such conditions, traditional narrative reviews often privilege selective thematic interpretations while overlooking structural transformations affecting the field itself. Bibliometric analysis, despite its own limitations and interpretative risks, offers the possibility of tracing conceptual convergence, thematic fragmentation, and emerging research frontiers across large-scale publication datasets.

The research was guided by three interrelated questions. First, how has scientific production related to leadership in remote and hybrid work evolved between 2020 and May 2027? Second, which conceptual clusters and intellectual structures dominate the field across different

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developmental phases? Third, what thematic transformations reveal the transition from crisis-response leadership toward technologically mediated, human-centered, and AI-supported organizational governance?

The bibliographic dataset was retrieved from the Scopus database because of its extensive interdisciplinary coverage and strong compatibility with bibliometric visualization software. Although Scopus indexing remains uneven geographically and tends to privilege English-language publications, it offers comparatively rich metadata appropriate for science mapping analyses involving management, leadership, technology, and organizational studies. The search was conducted in May 2027 using the following Boolean query applied to article titles, abstracts, and author keywords:

“leadership” OR “leadership style\*” OR “digital leadership”) AND (“remote work”  
OR “work from home” OR “telework” OR “virtual team\*” OR “hybrid work”)

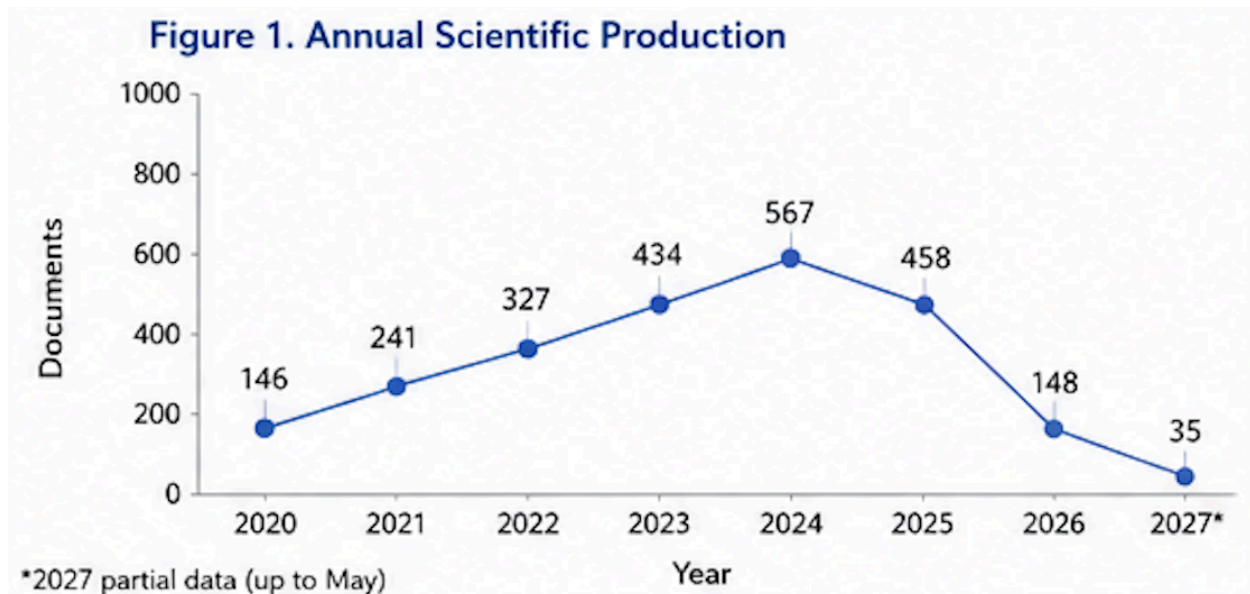
The search strategy was intentionally broad in order to capture conceptual diversity across leadership-related organizational scholarship rather than restrict the dataset exclusively to highly specialized managerial terminology. The analysis included peer-reviewed journal articles, review papers, and conference proceedings published in English between January 2020 and May 2027. Editorials, notes, corrections, and duplicate records were excluded. Following metadata cleaning procedures involving duplicate removal, author normalization, keyword harmonization, and source standardization, the final dataset consisted of 2,356 publications distributed across 684 publication sources involving 5,812 authors from 98 countries.

The methodological framework combined descriptive performance analysis with interpretative science mapping techniques. Publication growth trends, country productivity, source analysis, citation structures, and authorship patterns were first examined in order to identify the quantitative expansion of the field. This stage was followed by co-occurrence keyword analysis, co-citation analysis, bibliographic coupling, and thematic evolution mapping using VOSviewer and Biblioshiny (Bibliometrix package in RStudio). VOSviewer was selected primarily for network visualization because of its ability to generate relational maps based on keyword proximity, citation density, and thematic clustering, while Biblioshiny facilitated longitudinal thematic interpretation and conceptual structure analysis.

The analysis was conducted through three partially overlapping chronological phases corresponding to broader conceptual transformations visible within the literature itself. The first phase (2020–2021) captured pandemic-driven leadership research emphasizing crisis communication, virtual coordination, productivity maintenance, work-life balance, and

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organizational continuity. The second phase (2022–2023) reflected the normalization of hybrid organizational structures and the increasing prominence of employee wellbeing, trust, psychological safety, organizational resilience, and engagement. The third phase (2024–May 2027) demonstrated substantial thematic diversification involving AI leadership, algorithmic management, employee experience, digital ethics, inclusive leadership, sustainability, and adaptive organizational governance.



**Figure 1:** Annual Scientific Production on Leadership in Remote Work Research (2020–2027)

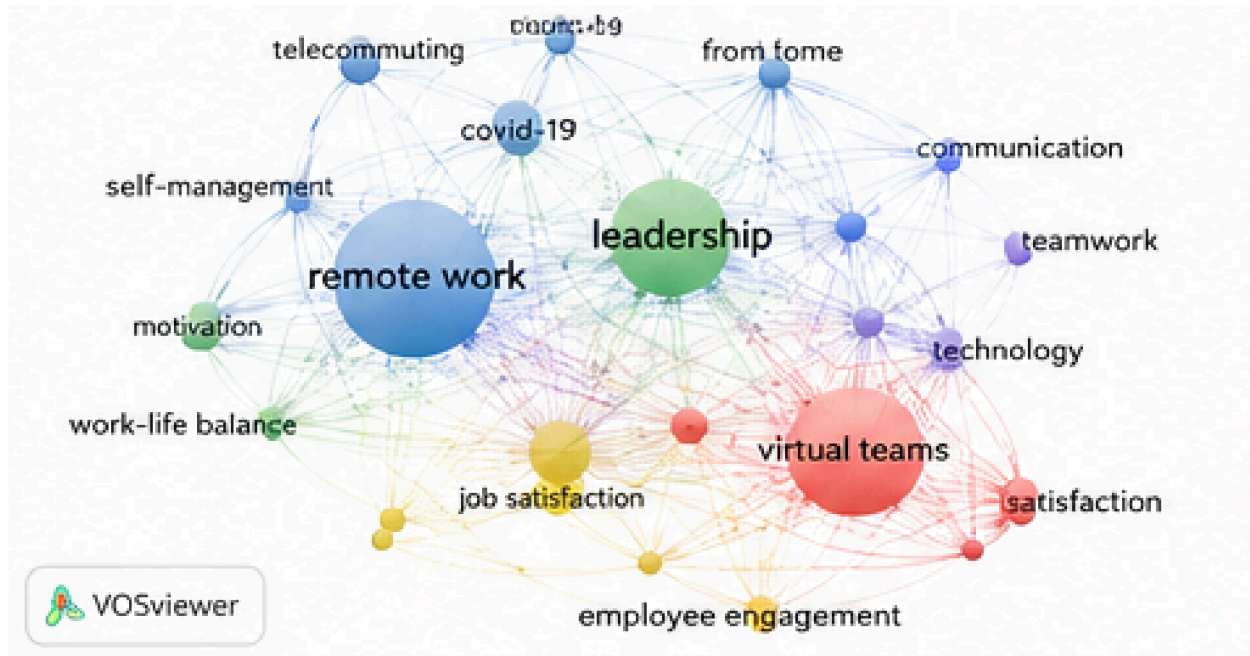
**Source:** Author's bibliometric analysis generated using Scopus metadata, VOSviewer, and Biblioshiny.

Figure 1 illustrates the rapid expansion of scientific production related to leadership in remote and hybrid work environments following the COVID-19 pandemic. Publication output increased sharply between 2020 and 2024, reflecting the centrality of remote organizational transformation within management and leadership scholarship. Although publication growth moderates slightly after 2025, thematic diversification simultaneously intensifies, suggesting conceptual maturation rather than scholarly decline. The figure indicates that remote leadership evolved rapidly from an emergency managerial concern into a stable interdisciplinary research field connected to digital transformation, employee wellbeing, organizational resilience, and AI governance debates.

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The co-occurrence keyword analysis was subsequently divided into three temporal phases in order to capture the conceptual evolution of the field more precisely. Rather than generating a single aggregated keyword network, the study intentionally separates thematic structures across different chronological periods because the meaning of leadership itself changed substantially throughout the post-pandemic transition. Aggregated bibliometric maps frequently obscure temporal conceptual shifts by merging early crisis-oriented themes with later socio-technical governance frameworks. The temporal segmentation therefore allows a more nuanced interpretation of how intellectual priorities evolved across successive organizational and technological phases.

The first co-occurrence analysis focused on the period between 2020 and 2021, when leadership scholarship was strongly shaped by emergency organizational adaptation and crisis-response management.



**Figure 2:** *Keyword Co-occurrence Map of Leadership in Remote Work Research (2020–2021)*

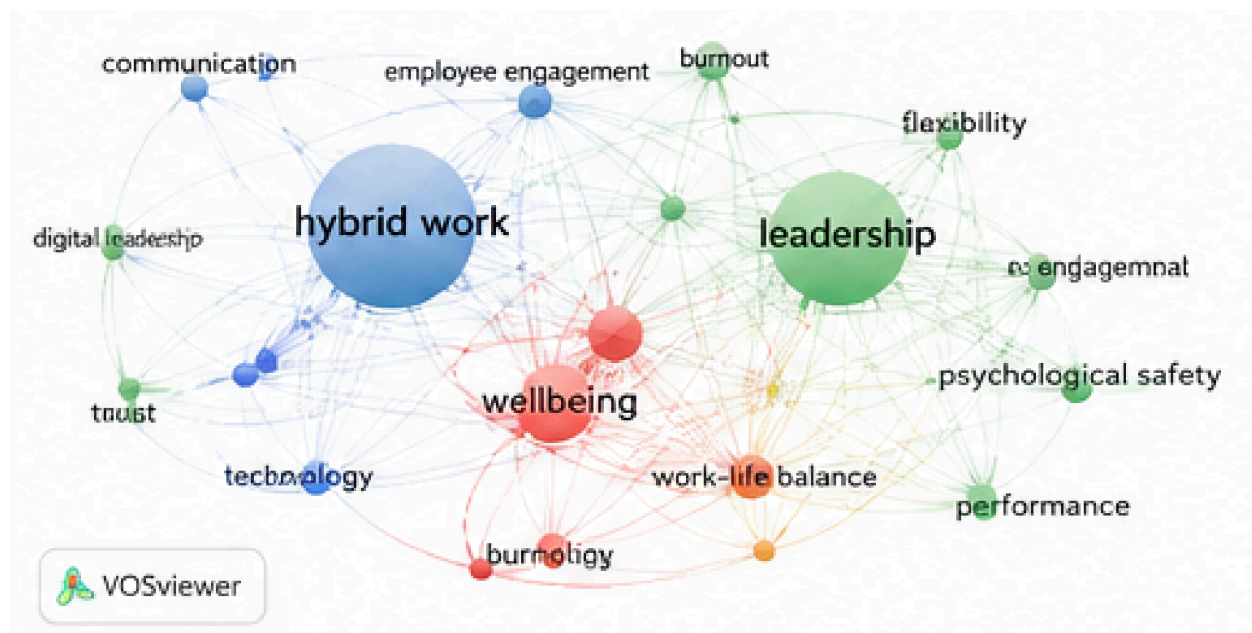
**Source:** Author’s visualization generated through VOSviewer based on Scopus-indexed author keywords.

Figure 2 demonstrates that early remote leadership research was dominated by operational and crisis-oriented concepts. Terms such as “remote work,” “COVID-19,” “virtual teams,” “telework,”

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“communication,” “productivity,” and “work-life balance” occupied highly central network positions, reflecting the managerial urgency of the pandemic period. Leadership during this phase was largely interpreted through organizational continuity and virtual coordination concerns rather than long-term structural transformation. Employee wellbeing appears within the network, though initially connected primarily to productivity and adaptation discourse rather than emerging as an autonomous conceptual cluster.

The second temporal network analysis examined the transition period between 2022 and 2023, when hybrid organizational models became increasingly normalized across institutions and organizations.



**Figure 3:** Keyword Co-occurrence Map of Leadership in Remote Work Research (2022–2023)

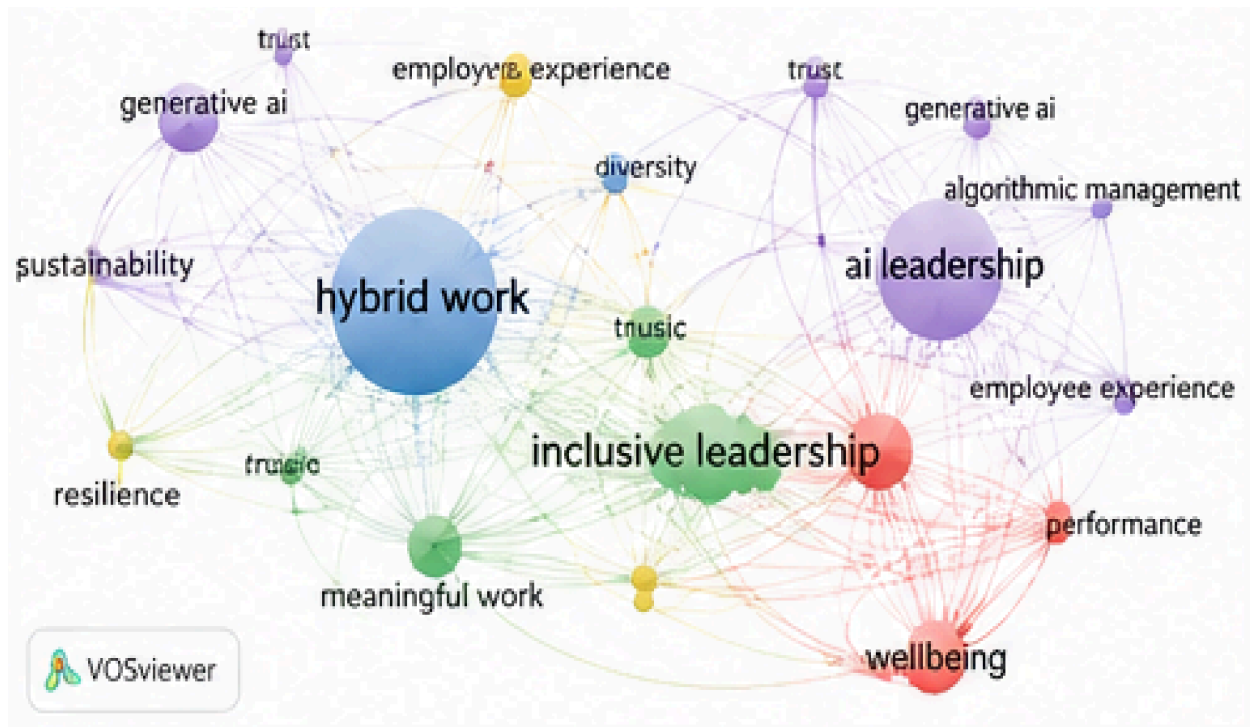
**Source:** Author’s visualization generated through VOSviewer based on Scopus-indexed author keywords.

Figure 3 reveals a noticeable conceptual shift toward more human-centered organizational concerns. During this period, thematic clusters associated with “hybrid work,” “employee wellbeing,” “psychological safety,” “organizational resilience,” “engagement,” and “trust” became progressively more central within the intellectual structure of the field. Leadership research moved beyond immediate crisis management toward broader discussions concerning

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sustainable organizational culture, emotional wellbeing, inclusion, and adaptive hybrid governance. The increasing prominence of trust-related terminology suggests that organizations were attempting to renegotiate managerial authority and employee autonomy within digitally mediated work systems where traditional forms of physical supervision became less relevant.

The final co-occurrence analysis focused on the period between 2024 and May 2027, reflecting the conceptual maturation and diversification of remote leadership scholarship.



**Figure 4:** Keyword Co-occurrence Map of Leadership in Remote Work Research (2024–May 2027)

**Source:** Author’s visualization generated through VOSviewer based on Scopus-indexed author keywords.

Figure 4 illustrates a substantial thematic expansion toward technologically integrated and socio-technical governance frameworks. Emerging clusters involving “AI leadership,” “algorithmic management,” “employee experience,” “digital ethics,” “inclusive leadership,” “sustainability,” and “organizational resilience” become significantly more visible and interconnected. Leadership is increasingly conceptualized not merely as interpersonal managerial influence, but as a form of governance operating through technologically mediated

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ecosystems involving digital infrastructures, AI-supported coordination, predictive analytics, and hybrid organizational cultures. The figure also suggests growing scholarly concern regarding ethical and human-centered dimensions of technologically accelerated workplaces.

Thematic evolution analysis was subsequently conducted using Biblioshiny in order to examine how dominant concepts emerged, converged, declined, or transformed across the study period. This stage proved particularly important because the field evolved with unusual conceptual speed after 2020. Certain themes associated with emergency adaptation and pandemic continuity became progressively peripheral after 2022, while concepts involving AI-supported governance, employee experience, digital ethics, sustainability, and adaptive organizational leadership gained increasing prominence.

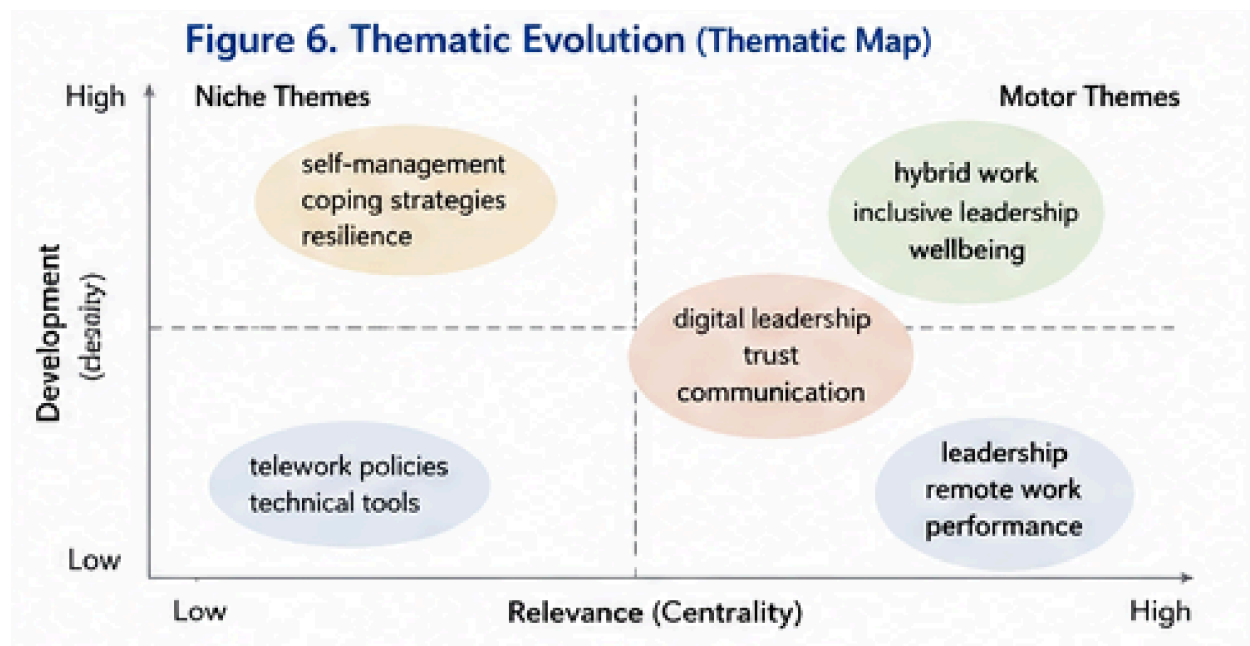


Figure 5: Thematic Evolution Map of Leadership in Remote Work Research (2020–2027)

Source: Author's thematic mapping generated through Biblioshiny (Bibliometrix) based on Scopus metadata.

Figure 5 synthesizes the broader conceptual transformation identified throughout the bibliometric analysis. The thematic map illustrates how remote leadership research evolved from

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crisis-driven managerial adaptation toward more sophisticated human-centered and technology-mediated governance frameworks. Early pandemic scholarship focused heavily on virtual communication, operational continuity, productivity maintenance, and remote coordination. Over time, these themes gradually intersected with employee wellbeing, trust, inclusion, organizational resilience, and psychological safety before expanding further toward AI leadership, digital ethics, algorithmic governance, employee experience, and sustainable hybrid organizational ecosystems.

The thematic evolution further suggests that future research trajectories will likely revolve around AI-supported leadership, ethical organizational governance, inclusion, sustainability, digital wellbeing, and the long-term societal consequences of hybrid organizational systems. In this sense, leadership in remote work increasingly appears not as a temporary managerial specialization emerging from the pandemic period, but as a broader analytical framework for understanding how authority, labor, organizational identity, and technological mediation are being reconfigured within digitally accelerated societies.

While the previous thematic maps reveal the structural evolution of the field quantitatively, the following figure provides a conceptual interpretation of the broader intellectual shifts that progressively transformed remote leadership research from crisis-response management toward human-centered and technology-mediated governance frameworks.

<b>2020–2021</b> (Adaptation Phase)	<ul style="list-style-type: none"><li>• Dominated by emergency remote work and crisis leadership.</li><li>• Focus on technology adoption, communication, productivity, and work–life balance.</li></ul>
<b>2022–2023</b> (Consolidation Phase)	<ul style="list-style-type: none"><li>• Shift toward hybrid work models and wellbeing.</li><li>• Growing attention to psychological safety, trust, autonomy, and organizational culture.</li></ul>
<b>2024–2027</b> (Transformation Phase)	<ul style="list-style-type: none"><li>• Rise of inclusive leadership, AI, and digital transformation.</li><li>• Emphasis on employee experience, meaningful work, sustainability, and ethical technology use.</li></ul>

Figure 6: Interpretation of Key Transformations in Leadership Research on Remote Work (2020–2027)

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**Source:** Author's interpretative synthesis based on bibliometric mapping generated through VOSviewer and Biblioshiny analyses of Scopus-indexed publications.

The interpretative trajectory illustrated in Figure 7 suggests that leadership research in remote work environments evolved through three distinct yet interconnected conceptual phases. The initial adaptation phase was primarily reactive, shaped by organizational survival under conditions of abrupt digital transition and pandemic disruption. Leadership during this period was largely operationalized through communication efficiency, virtual coordination, and productivity maintenance. By contrast, the consolidation phase reflects a broader recognition that remote and hybrid work systems generate significant psychological, cultural, and organizational implications extending beyond technological adaptation alone. Themes such as trust, wellbeing, autonomy, and psychological safety became progressively central as organizations attempted to stabilize hybrid work arrangements over the longer term.

The most recent transformation phase indicates a substantial conceptual expansion of the field toward socio-technical and human-centered governance frameworks. Leadership is increasingly examined in relation to AI-supported coordination, ethical technology integration, employee experience, inclusion, sustainability, and digitally mediated organizational cultures. The evolution identified across the bibliometric networks therefore suggests that remote work leadership research is progressively shifting away from short-term managerial adaptation toward broader concerns involving organizational legitimacy, technological governance, and the future structure of work itself. In this sense, leadership scholarship increasingly reflects wider societal transformations associated with digital acceleration, hybrid institutionalization, and the growing integration of algorithmic systems into organizational life.

Several methodological limitations should nevertheless be acknowledged. Bibliometric analyses inevitably privilege indexed publication visibility and citation accumulation, potentially underrepresenting regional scholarship, practitioner-oriented research, or emerging interdisciplinary contributions outside major indexing systems. English-language dominance within Scopus may also distort global representation patterns. Furthermore, bibliometric proximity does not necessarily imply conceptual coherence; some thematic connections emerge from indexing practices rather than genuine theoretical integration. The interpretation of network clusters therefore required contextual reading of highly cited publications and thematic trajectories in order to avoid purely mechanical visualization analysis. Consequently, the present study approaches bibliometric mapping not as a definitive representation of intellectual reality, but as an interpretative analytical framework capable of revealing broader structural tendencies and emerging transformations within leadership scholarship related to remote and hybrid work.

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### **5 DISCUSSION**

The bibliometric patterns identified throughout the analysis suggest that leadership research in remote and hybrid work environments has evolved far beyond the temporary managerial adaptation discourse that dominated the earliest pandemic period. What initially emerged as an emergency organizational response gradually transformed into a more structurally complex field engaging with hybrid governance, socio-technical coordination, employee wellbeing, AI-supported organizational systems, and digitally mediated workplace identities. The transformation is significant not simply because publication volume increased rapidly, but because the intellectual architecture of the field itself became progressively more interdisciplinary, fragmented, and conceptually reflexive.

One of the more striking developments concerns the changing meaning of leadership under remote organizational conditions. Early pandemic studies frequently approached leadership through operational categories such as communication continuity, virtual supervision, coordination efficiency, and productivity stabilization (Contreras et al., 2020; Dirani et al., 2020). Leadership functioned primarily as a managerial mechanism intended to preserve organizational functionality during crisis disruption. Over time, however, the field increasingly shifted toward relational and socio-emotional dimensions involving trust, inclusion, psychological safety, emotional sustainability, and organizational belonging. This evolution reflects a broader transformation in organizational priorities. Hybrid work systems are no longer interpreted solely as technological arrangements requiring logistical adaptation; they increasingly represent new organizational environments reshaping authority, interaction, and workplace identity itself.

The findings also suggest that remote leadership research destabilizes several assumptions embedded within traditional leadership theory. Conventional organizational leadership models generally presupposed physical co-presence, observable managerial interaction, and relatively stable institutional environments. Earlier e-leadership and virtual team scholarship had already questioned some of these assumptions (Avolio et al., 2001; Bell & Kozlowski, 2002), yet the widespread normalization of hybrid work after 2020 accelerated these transformations dramatically. Leadership became partially detached from physical visibility and increasingly mediated through digital infrastructures, communication platforms, algorithmic systems, and asynchronous organizational processes. In this context, leadership appears progressively less tied to individual managerial presence and more connected to the governance of technologically mediated organizational ecosystems.

The growing prominence of employee wellbeing within the thematic networks deserves particular attention. During the initial pandemic phase, wellbeing frequently appeared

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subordinated to productivity and organizational continuity concerns. More recent publications increasingly approach wellbeing as a central organizational priority connected to resilience, inclusion, engagement, trust, and long-term sustainability. Studies examining stress, emotional fatigue, and digital overload became especially influential after 2022 (Gómez et al., 2022; Wang et al., 2021). This shift suggests that leadership scholarship is gradually responding to broader post-pandemic anxieties surrounding burnout, cognitive exhaustion, and the emotional consequences of digitally intensified labor systems. Yet the literature remains divided regarding how organizations should balance flexibility, productivity, and employee autonomy within permanently hybridized environments.

Another important finding concerns the increasing intersection between leadership research and digital governance scholarship. Remote work leadership is progressively connected to discussions involving AI-supported coordination, algorithmic management, employee analytics, digital surveillance, and organizational data infrastructures. Leonardi's (2021) analysis of "digital exhaust" appears particularly significant here because it captures how organizational visibility itself becomes transformed within digitally mediated systems. Leadership under these conditions increasingly involves managing information flows, communication architectures, behavioral data, and technologically supported decision-making processes rather than relying exclusively upon interpersonal influence or hierarchical supervision.

At the same time, the field reveals substantial conceptual fragmentation. Organizational psychology studies frequently emphasize trust, emotional wellbeing, and psychological safety. Information systems research tends to foreground digital infrastructures, technological adaptation, and virtual collaboration processes. Management scholarship often prioritizes productivity, performance, resilience, and strategic coordination, while critical organizational studies increasingly interrogate surveillance, algorithmic control, and digital labor precarity. These perspectives frequently intersect without fully converging theoretically. Similar organizational phenomena are therefore interpreted through divergent conceptual vocabularies depending on disciplinary orientation. This fragmentation complicates theoretical consolidation, though it also reflects the inherently interdisciplinary nature of remote and hybrid organizational systems.

The emergence of AI leadership and algorithmic management as visible thematic clusters may represent one of the most important transformations identified within the bibliometric analysis. Earlier remote work scholarship generally positioned technology as a facilitative infrastructure supporting communication and coordination. More recent studies increasingly conceptualize AI systems as active organizational actors shaping managerial authority, workflow organization, employee monitoring, and decision-making processes. Leadership under these conditions risks

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becoming partially automated, with authority distributed across predictive analytics systems, behavioral monitoring platforms, and algorithmic coordination architectures. The literature has not yet resolved whether such developments represent an extension of leadership or a gradual displacement of human managerial agency itself.

The findings also reveal that explicitly pandemic-centered terminology declines sharply after 2022. Terms such as “COVID-19,” “pandemic leadership,” and “crisis response” become progressively peripheral within later thematic networks, replaced by structurally oriented concepts such as hybrid governance, digital resilience, employee experience, AI-supported leadership, and organizational sustainability. This transition is analytically important because it indicates that remote leadership has evolved from a temporary emergency management concern into a broader organizational paradigm reshaping how work itself is conceptualized. Hybrid organizational systems increasingly appear normalized rather than exceptional.

A further implication emerging from the analysis concerns the growing socio-technical character of organizational authority. Earlier leadership theories generally focused on interpersonal influence, organizational hierarchy, or managerial traits. The contemporary remote work literature increasingly implies that organizational coordination now occurs through interconnected systems involving human actors, digital platforms, communication infrastructures, behavioral analytics, and AI-supported technologies simultaneously. Leadership under such conditions becomes infrastructural as much as relational. Authority is exercised not only through managerial interaction, but also through platform architectures, algorithmic visibility systems, communication interfaces, and digital organizational routines.

The preceding analysis also suggests that the field may be entering a broader post-human organizational phase, although this remains conceptually underdeveloped within current scholarship. Some recent publications implicitly challenge anthropocentric assumptions embedded within traditional leadership theory by examining how organizational decision-making becomes distributed across human and technological systems. AI-supported coordination, predictive analytics, employee monitoring systems, and automated workflow architectures increasingly participate in organizational governance processes that were historically associated with human managerial authority alone. While still emergent, this trajectory may eventually require substantial reconceptualization of leadership itself.

The broader significance of the findings lies perhaps in the realization that leadership research in remote work environments increasingly functions as a diagnostic field through which wider societal transformations become visible. The evolution from crisis coordination and virtual supervision toward hybrid governance, AI-supported management, digital ethics, emotional

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sustainability, and employee experience reflects changing understandings of authority, labor, organizational legitimacy, and human interaction within digitally accelerated societies. Leadership, in this emerging context, becomes less about supervising physical workplaces and more about governing technologically mediated ecosystems where organizational life unfolds simultaneously across human, emotional, digital, and algorithmic dimensions.

### **6 CONCLUSION**

The present study examined the intellectual evolution of leadership research in remote and hybrid work environments between 2020 and May 2027 through a bibliometric and thematic analysis of Scopus-indexed publications. The findings suggest that leadership in remote work can no longer be interpreted merely as a temporary organizational adaptation associated with pandemic disruption. Instead, the field increasingly reflects a deeper transformation affecting organizational governance, workplace identity, technological mediation, and the future structure of labor itself. What began as crisis-oriented scholarship centered on communication continuity and productivity stabilization progressively evolved into a broader interdisciplinary domain engaging with employee wellbeing, hybrid governance, digital trust, AI-supported coordination, algorithmic management, and socio-technical organizational ecosystems.

The analysis identified three partially overlapping developmental phases. The earliest phase was strongly shaped by emergency organizational adaptation during the COVID-19 crisis, emphasizing virtual communication, remote supervision, productivity maintenance, and work-life balance. The second phase reflected the normalization of hybrid organizational systems and the growing prominence of trust, psychological safety, employee engagement, and organizational resilience. The most recent phase demonstrated substantial thematic diversification involving AI leadership, digital ethics, employee experience, inclusive governance, algorithmic coordination, and adaptive organizational infrastructures. This thematic transition suggests that leadership scholarship itself is increasingly adapting to broader structural transformations associated with digital acceleration and hybrid institutionalization.

One of the more important contributions of the study lies in demonstrating that leadership research related to remote work has become simultaneously more interdisciplinary and more conceptually fragmented. Organizational psychology, digital governance, information systems, management studies, and organizational behavior increasingly intersect within the field, producing conceptual richness alongside theoretical instability. Leadership no longer appears exclusively associated with interpersonal managerial influence or hierarchical supervision. Instead, authority and coordination increasingly operate through communication infrastructures,

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platform architectures, digital systems, employee analytics, and algorithmic organizational processes. The findings therefore suggest that leadership theory may be undergoing a gradual transition toward socio-technical and partially post-human organizational frameworks.

The study also highlights the growing centrality of employee wellbeing and emotional sustainability within hybrid organizational research. Earlier pandemic scholarship often approached wellbeing instrumentally, primarily as a condition necessary for maintaining productivity and organizational continuity. More recent literature increasingly frames psychological safety, inclusion, organizational belonging, and emotional resilience as strategic and ethical dimensions of sustainable organizational governance. Nevertheless, tensions remain unresolved. Hybrid work environments continue to generate contradictory experiences involving flexibility and surveillance, autonomy and digital overload, connectivity and isolation simultaneously. Remote leadership research therefore reflects broader societal ambivalence regarding technologically mediated labor systems.

Several limitations should be acknowledged. The analysis relied exclusively on Scopus-indexed English-language publications, which may underrepresent regional scholarship, practitioner-oriented research, or emerging interdisciplinary contributions outside major indexing systems. Bibliometric methods also privilege publication visibility and citation accumulation, potentially distorting emerging thematic influence patterns. Furthermore, conceptual interpretation within co-occurrence and thematic networks inevitably involves analytical subjectivity despite the use of quantitative visualization tools. Certain conceptual clusters overlap due to indexing practices rather than coherent theoretical integration. The field itself also remains highly dynamic, particularly regarding AI-supported organizational governance and algorithmic management research, meaning that some thematic trajectories remain insufficiently consolidated.

Future research may benefit from combining bibliometric approaches with qualitative organizational case studies, comparative cross-sector analyses, and longitudinal investigations examining how leadership differs across higher education, healthcare, public administration, technology industries, and transnational digital organizations. Additional attention should be devoted to AI-mediated leadership, employee surveillance systems, emotional sustainability, cognitive overload, hybrid organizational identity, and digital wellbeing within permanently hybridized workplaces. Particularly promising are emerging discussions surrounding post-human organizational coordination, where leadership increasingly involves interaction not only between human actors but also between employees, AI systems, predictive infrastructures, automated workflows, and algorithmic decision architectures.

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The findings further suggest several underdeveloped research frontiers likely to become increasingly significant over the next decade. These include ethical governance of AI-supported leadership systems, organizational trust under algorithmic management conditions, digital fatigue and cognitive sustainability, employee autonomy within data-driven workplaces, and the transformation of authority within platformized organizational ecosystems. The growing integration of generative AI and predictive organizational analytics may ultimately reshape not only managerial practices but also the conceptual foundations of leadership theory itself.

Ultimately, the study suggests that leadership in remote and hybrid work environments represents more than a specialized managerial subfield emerging from the pandemic period. It increasingly functions as a broader analytical lens through which deeper transformations affecting organizational authority, labor systems, technological mediation, and human interaction become visible. Leadership within digitally accelerated societies appears progressively less dependent upon physical supervision and more connected to the governance of complex socio-technical ecosystems where organizational life unfolds simultaneously across emotional, digital, infrastructural, and algorithmic dimensions.

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