

# The Formation Process and Implications of Team Cohesion in Virtual Work Environments

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## ABSTRACT

Team cohesion in virtual environments presents a distinct challenge compared to traditional co-located teams. This literature study aims to analyze the process of cohesion formation in virtual settings and its connection to collective performance. The findings indicate that building cohesion in virtual teams is an intentional process, heavily influenced by the reduced social bandwidth of digital media. It requires proactive virtual leadership to architect social interactions, strategic selection of communication technologies, and the conscious cultivation of cognitive trust based on observed reliability and competence. Cohesion in this realm manifests through a shared digital identity constructed via collective narratives and symbols. The relationship between cohesion and performance is complex and mediated by factors such as communication quality, task interdependence, and temporal project phases. Task cohesion shows a more direct positive correlation with performance metrics by enhancing coordination efficiency. Social cohesion's impact is more nuanced and contingent on team norms that prevent groupthink. The study concludes that virtual team cohesion is both achievable and critical, serving as a strategic foundation for enabling sustainable high performance in distributed work arrangements, necessitating deliberate design and continuous nurturing of the team's social fabric.

## INTRODUCTION

The development of information and communication technology has fundamentally transformed the organizational work landscape. Before the digital era, work interactions were largely confined within the physical boundaries of office spaces, where teams gathered, discussed, and built relationships directly. The social dynamics in this traditional work environment allowed for the formation of relatively natural interpersonal bonds through face-to-face contact, body language, and spontaneous interactions in between work activities. This condition shows that the way individuals interact and build social perceptions in the digital world indeed possesses very different characteristics compared to direct interaction (da Costa et al., 2022). The shift toward virtual work environments, accelerated by high-speed internet advancements and collaboration tools, presents a new paradigm (Sivunen & Laitinen, 2019). In this paradigm, coordination and the execution of collective tasks no longer require physical presence in a single location. Geographically dispersed

groups of individuals can unite their expertise to achieve common goals, relying on digital media as the primary channel for communication and coordination (Srivastava, 2020). While this shift opens significant opportunities for organizations to access global talent and increase operational flexibility, it simultaneously subjects traditional concepts of team dynamics to re-examination.

The concept of team cohesion, as a central construct in the study of group dynamics, classically refers to the forces that keep team members united and motivated to maintain their membership within the group (Stawnicza, 2022). This cohesion is often viewed as a product of repeated social interactions, the formation of shared norms, mutual trust, and collective experiences in overcoming difficulties. In conventional settings, the process of forming this cohesion can be observed and facilitated through shared activities, retreats, or even informal conversations in break areas (Chaudhary et al., 2022). Besides interaction factors, the support of social capital and strong team collaboration serve as vital foundations in maintaining the quality of work

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within an organization (Putra et al., 2021). The quality of a team's cohesion is traditionally linked to various positive outcomes, such as increased member satisfaction, stronger commitment to group goals, and ultimately, enhanced collective performance. The understanding of how team cohesion develops and is maintained has long been built on the assumption of a shared physical environment, where social signals can be captured fully and in real-time. This very assumption serves as the basis for many team cohesion theories and models developed during the 20th century.

The transition to virtual environments dismantles most of these fundamental assumptions. Virtual environments, with their distinct characteristics, create qualitatively different conditions for team social processes (Cai, 2023). Communication occurring largely through limited text, audio, or video channels often eliminates rich non-verbal dimensions and spontaneous interaction. Additionally, gaps in digital skill mastery and technology access pose extra challenges to smooth team coordination (Arifin & Darmawan, 2021). Asynchronous communication, common in email-based work or messaging platforms, can slow the rate of building shared understanding and decision-making. Virtual spaces also tend to separate an individual's work life from a cohesive group identity, as each member operates from an isolated and different physical environment (Roth & Doehne, 2023). These conditions raise fundamental questions about the resilience and adaptation of the team cohesion concept: are the forces that unite a team in the virtual world the same as those working in physical environments? Or does virtual work give rise to a new variant of team cohesion, with different precursors, manifestations, and consequences?

Further specification points toward the unique dynamics emerging within virtual teams. Challenges faced include the difficulty of building trust without consistent visual cues, a higher risk of miscommunication due to reliance on lean media, and feelings of isolation that team members may experience (Florea & Stoica, 2019). These communication issues often trigger conflict, especially in teams with members from diverse cultural backgrounds, necessitating appropriate handling strategies (Marsal & Darmawan, 2022). Forming a strong group identity becomes more difficult when members rarely, if ever, experience a collective presence in a physical sense (von Thülen & Hartl, 2021). Team norms must be negotiated and communicated explicitly, as there are no opportunities to observe and imitate behavior

directly. The influence of human resource quality on worker performance and employee loyalty shows that the human factor remains key in every form of work organization, including virtual-based ones (Darmawan et al., 2020). To support such performance, the implementation of cross-functional training is highly helpful in enhancing solid teamwork (Fared & Darmawan, 2021). The socialization process for new members also becomes more complex in a dispersed environment. All these factors potentially act as barriers to the development of togetherness, solidarity, and mutual commitment the core of team cohesion. Therefore, exploring the nature of team cohesion in a virtual environment is not merely the application of old theories to new media, but rather requires a re-investigation of the construct itself

The focus of this study is on team cohesion within purely virtual work environments, specifically teams whose members interact almost exclusively through information technology to achieve shared work goals. This study seeks to explore how the unique characteristics of virtual environments such as varying media richness, differing temporal alignment, and limited levels of social presence shape the processes of formation, maintenance, and the impact of team cohesion. The success of this process relies heavily on how leaders manage change and adapt their leadership styles to the existing team situation (Mardikaningsih & Darmawan, 2022). It is essential to understand whether cohesion in virtual teams is multidimensional like in conventional teams, encompassing task and social aspects, or if it develops within a different structure. Furthermore, it is necessary to examine how such cohesion relates to factors such as communication technology choices, task design, virtual leadership, and member characteristics. A comprehensive understanding of this is required to develop a framework that can guide management practices and team design in the rapidly evolving digital era.

One of the primary problems faced in understanding virtual team cohesion lies in the ambiguity regarding the fundamental nature of the construct within the digital realm. Existing theories of team cohesion, largely built on observations of face-to-face groups, may not be fully capable of capturing the essence of the experience of togetherness in a dispersed environment. Moreover, global-scale teamwork demands communication practices that understand the cultural frameworks of each member (Sajjapong & Irfan, 2022). Cohesion is often measured through individual perceptions of

group attractiveness and commitment to tasks, yet these measurement instruments may overlook new dimensions relevant to virtuality, such as feelings of digital connectivity or a sense of belonging in a shared online space. There is a conceptual gap between how cohesion is manifested and experienced in physical versus virtual spaces. Without this conceptual clarity, efforts to research, measure, and ultimately enhance cohesion in virtual teams become aimless. Researchers and practitioners risk using an inappropriate lens to diagnose the social condition of a virtual team, which in turn can produce intervention recommendations that are ineffective or even counterproductive.

Another significant problem is the complexity of the relationship between communication technology and the social processes of cohesion building. Digital media used by virtual teams vary in their ability to convey social and emotional cues. Text-based communication, for instance, is efficient for exchanging factual information but is poor at conveying nuances and building rapport. Meanwhile, video conferencing offers a visual presence but can feel stiff and does not always support spontaneous side interactions. Therefore, the role of leadership oriented toward digital aspects is crucial in creating operational efficiency and innovation within the team (Darmawan & Gardi, 2024). The problem is that the selection and use of these technologies are often driven by considerations of cost, convenience, or habit, rather than an understanding of their impact on group dynamics. There is no one-size-fits-all approach; technology that supports cohesion for one team may actually hinder another, depending on the nature of the task, the stage of team development, and the cultural background of the members. Mapping how technical media characteristics such as synchronicity, permanence of record, and symbol sets interact with the psychosocial processes of cohesion formation remains a complex and not yet fully resolved challenge.

The study of virtual team cohesion has become vital given the massive transformations in global work patterns occurring recently. Many organizations, whether permanently or in a hybrid manner, have adopted work models that rely on dispersed teams. The operational continuity and competitiveness of these organizations increasingly depend on the ability of their virtual teams to function cohesively and effectively. In multicultural organizations, the use of situational leadership has proven effective in driving team performance to its maximum (Gardi et al., 2024).

However, without a strong understanding of how team cohesion is built and maintained in the absence of physical interaction, organizations operate on a fragile foundation. Investments in sophisticated collaboration technologies may not yield improvements in team performance if the social and psychological aspects of team togetherness are ignored. Therefore, systematic scientific study is necessary to provide an evidence-based foundation for organizational decision-making regarding team design, leadership training, technology platform selection, and the development of virtual work policies. This knowledge helps mitigate risks such as declining morale, increased turnover, and project failures caused by social dysfunction within virtual teams.

Furthermore, the rapid developments in the field of collaboration technology itself demand a refresh of academic understanding. The emergence of platforms that integrate communication, project management, and social elements creates virtual environments that are increasingly complex and immersive. Virtual and augmented reality are beginning to offer new possibilities for meetings and teamwork. Creativity and the culture of innovation within a group are also highly influenced by how managerial roles are executed to support new ideas (Özkaya et al., 2023). Current studies are needed to evaluate whether these technological innovations can truly replicate or even surpass the conditions for cohesion formation in physical environments, or if they instead create unique new social dynamics. By examining virtual team cohesion through a comprehensive literature review, we can identify psychosocial principles that remain valid regardless of technological changes, as well as aspects that need to be reconceptualized. This allows for the development of theories relevant to the times while providing useful guidance for technology designers and organizational consultants in creating solutions that truly support the humanity and effectiveness of teamwork in the digital world.

This literature study aims to investigate and analyze the concept of team cohesion comprehensively within virtual work environments through a systematic review of relevant scientific literature. Its specific objective is to identify and elaborate on the mechanisms and key factors influencing the development and sustainability of cohesion when team interactions occur digitally and in a dispersed manner. Additionally, this study seeks to map the relationship between the level of cohesion achieved in virtual teams and various indicators of team effectiveness, such as output

quality, member satisfaction, and goal attainment. Theoretically, the expected contribution is a conceptual synthesis that can clarify and perhaps expand the understanding of the team cohesion construct in the digital era, while simultaneously highlighting knowledge gaps that require further research. Practically, the findings of this study are expected to serve as a basis for drafting applicable guidelines and recommendations for managers, team leaders, and collaboration system designers in their efforts to build and maintain virtual teams that are solid, motivated, and high-performing.

## RESEARCH METHOD

This research is structured as a qualitative literature study that is exploratory and analytical in nature. This approach was chosen because it aligns with the objective of understanding, interpreting, and synthesizing concepts and patterns developing in the scientific study of virtual team cohesion. A literature study is not merely a descriptive summary, but rather a systematic process to identify, evaluate, and integrate findings from various academic text sources to build a coherent and in-depth understanding of the topic under study. This methodology allows the researcher to trace the development of thought, identify consensus and theoretical debates, and formulate conceptual propositions based on the synthesis of various previous studies without involving the collection of primary data in the field. This process follows the principles outlined by experts in qualitative research methods, who emphasize the importance of comprehensive literature searches and thematic analysis of text content (Creswell, 2009).

The operational stages of this research began with the planning of the literature search. The main keywords used included "team cohesion," "virtual teams," "group cohesion," "computer-mediated communication," and "distributed work." The search was conducted across prominent academic databases such as Scopus, Web of Science, and Google Scholar, with publication time limits to ensure the relevance of the findings. Once the articles and sources were gathered, a selection process was carried out based on inclusion and exclusion criteria, such as a focus on empirical or conceptual studies discussing cohesion in teams that work virtually. The data analysis stage was performed using a thematic content analysis approach, as developed by Braun and Clarke (2006). This technique involves repeated in-depth reading of the selected texts, coding relevant data segments, grouping codes into initial themes, and then revising and defining those themes

until a narrative pattern is formed that addresses the research problem. The synthesis process was conducted by comparing and contrasting findings from various literatures to construct logical and evidence-based arguments, which were then presented in the results and discussion chapter.

## RESULT AND DISCUSSION

### Dynamics of Team Cohesion Formation in Virtual Environments

Virtual team cohesion is formed within unique digital dynamics. The formation of team cohesion in a virtual environment is a qualitatively different process compared to conventional settings. This process is not linear or automatic, but rather influenced by a series of unique inhibitory and driving factors arising from the characteristics of the digital media itself. Digital transformation in the manufacturing industry and the legal aspects of worker data protection show that technological changes bring broad consequences to the way humans work and collaborate (Osean et al., 2024). One of the fundamental characteristics shaping this dynamic is the low social bandwidth available on most virtual communication tools. In face-to-face interactions, social and emotional information flows through various parallel channels: spoken words, tone of voice, facial expressions, gestures, and even physical proximity. These channels, which often work subconsciously, facilitate the rapid building of rapport, empathy, and trust. In a virtual environment, especially those relying on text or audio communication alone, these channels are drastically reduced. Team members must exert more effort to convey their intentions and emotions, while also facing a greater risk of misinterpreting messages from their colleagues. These limitations in the early stages of team formation can slow the development of familiarity and mutual understanding, which are the foundational bricks of social cohesion. Digital social limitations delay the establishment of team familiarity.

Virtuality presents a risk of isolation that erodes togetherness. However, virtual environments also present conditions that can actively hinder the emergence of a sense of togetherness if not managed intentionally. The feeling of being physically and socially isolated is a significant psychological challenge that can erode the social capital essential for teamwork. When a team member works from a separate location, without a shared background of office activities or opportunities for casual small talk in the corridors, they can feel like a separate work unit rather than part of a living collective entity. This feeling is exacerbated by

technological inconveniences, network issues, or time zone differences that make coordination feel like a burden a phenomenon identified as "temporal challenges" in virtual teams (Gilson et al., 2015). Under such conditions, self-identity becomes more attached to individual roles or work locations than to the overall team identity, a process that can hinder the formation of trust and mutual interdependence. Without deliberate efforts to create meaningful shared experiences, team members may never develop the sense of belonging and emotional commitment that defines a cohesive team. They remain a collection of individuals working on related tasks, rather than a team united by shared goals and social bonds. Without intervention, virtual teams risk remaining fragmented.

Virtual leadership becomes a critical factor in the formation of team cohesion. A critical factor influencing the dynamics of cohesion formation is the role of virtual leadership. Team leaders in a virtual setting bear a heavier responsibility in initiating and maintaining social processes. Communication quality serves as a mediator in the relationship between internal and external leadership roles and trust (Kashive et al., 2022). They cannot rely on physical presence or natural charisma felt in a room; instead, they must proactively use existing communication channels to create social structures. Effective virtual leaders act as architects of interaction. They must design online meeting agendas that do not only focus on tasks but also explicitly set aside time for social discussions, such as checking in on one another or sharing relevant personal experiences. They need to establish clear communication norms—such as expected response times or group chat etiquette—to create a sense of order and fairness. Furthermore, leaders must serve as models in building trust by consistently demonstrating reliability, openness, and support through digital communication. Without active initiatives from the leader, the virtual space tends to become sterile and oriented solely toward task transactions, where social cohesion will find it difficult to take root. Proactive leadership fosters social cohesion in the virtual space.

Tuckman's model remains relevant but is distorted within virtual teams. The stages of team development also exhibit interesting dynamics. Classic team development models, such as the one proposed by Tuckman (forming, storming, norming, performing), still apply in virtuality, but each stage faces specific distortions or time extensions. The forming stage can become longer as members get to know each other through limited digital profiles. The storming stage, where conflicts

emerge, can be more intense or, conversely, more hidden. Conflicts in virtual teams are often latent, manifesting as delays, passive engagement, or cold and formal communication, as members avoid direct confrontations which are perceived as more difficult to handle online. If left unresolved, these latent conflicts can become toxic, preventing the team from reaching the norming stage the point where norms and cohesion truly take shape. Understanding these stage dynamics is crucial for anticipating critical points where facilitative interventions are needed to keep the cohesion formation process on track and address friction arising from the media. Timely intervention keeps virtual teams moving toward cohesion.

Media choice and communication patterns shape the social landscape of virtual teams. The chosen communication media and their patterns of use profoundly shape the social landscape of a virtual team. Media Richness Theory implies that ambiguous tasks requiring social negotiation are better handled by rich media, such as video conferencing. Utilizing rich media at key moments such as project kick-offs, conflict resolution, or celebrating achievements can provide a powerful social injection, accelerating the building of trust and a sense of togetherness. Conversely, over-reliance on email or text messages for complex discussions can create confusion and emotional coldness. Usage patterns are also important. Communication that is entirely structured and focused on formal agendas tends to stifle social cohesion. On the other hand, successful teams often develop their own digital "side spaces" such as informal chat channels or social forums which allow for spontaneous, non-task interactions, mimicking the function of office coffee pantry chats. The existence of such spaces serves as both an indicator and a driver for the growth of social cohesion. Digital side spaces accelerate the growth of social team cohesion.

Virtual team identity must be built symbolically and intentionally. Team identification is a fundamental predictor of efforts made on behalf of the organization (Ruggieri et al., 2023). Forming a strong team identity is both an objective and a result of developing cohesion. In a virtual environment, this identity must be constructed more deliberately and symbolically. Without a physical office or uniforms, teams need to create shared symbols in the digital space. This can include a distinctive team name, a logo, an online workspace with a consistent visual theme, or specific virtual rituals such as weekly kick-off meetings with a set format. Shared narratives are also crucial. Leaders and members

need to actively frame their experiences the challenges overcome, the successes achieved as a collective story, rather than just a series of individual events. Disseminating this narrative through team communication reinforces the feeling that all members are part of the same journey. A strong team identity then acts as a social magnet, drawing members to be more committed and feel proud to be part of the group, which in turn further strengthens cohesion. A strong team identity becomes a social magnet for cohesion.

Global diversity adds complexity as well as opportunities for team cohesion. The diversity of member backgrounds, which is often greater in global virtual teams, adds another layer of complexity to the dynamics of cohesion formation. Differences in culture, language, and work norms can be a source of rich perspectives, but also a potential source of misunderstanding and fragmentation. Cohesion in a diverse team does not mean uniformity, but rather mutual respect and a unifying purpose. Building this requires explicit cultural awareness and the creation of hybrid norms resulting from consensus, rather than dominance by the majority culture. The negotiation process to create these shared work norms itself, if well-facilitated, can become a powerful team-bonding activity, as it involves all members in shaping their own social environment. Hybrid norms resulting from consensus strengthen cohesion within diversity.

The virtual time dimension demands a balance in communication rhythm. Time dimensions play a dual role. On one hand, virtual work is often flexible and asynchronous, which can grant individual freedom but sacrifice collective momentum. On the other hand, asynchronicity can slow down feedback and decision-making, making social processes feel fragmented. To build cohesion, a balance is required. Regularly scheduled synchronous interactions (such as weekly video meetings) are important for maintaining a shared rhythm and social presence. Well-structured asynchronous interactions (such as updates on project boards) keep task progress moving and provide visibility for individual contributions. This predictable communication rhythm creates a sense of stability and observable interdependence, which becomes the foundation for task-based cohesion. Synchronous and asynchronous rhythms uphold task-based cohesion.

Cognitive trust becomes the initial foundation of virtual team cohesion. Trust is a non-negotiable foundation for team cohesion, and in virtuality, this trust is primarily cognitive rather than affective in

the early stages. Affective trust is based on emotional bonds and empathy, which are more difficult to build from a distance. Cognitive trust, conversely, is built on evidence of competence, reliability, and professionalism. In virtual teams, members tend to first trust their colleagues because they complete tasks on time, respond to queries diligently, and demonstrate their expertise through their work. It is these visible behavioral evidences that, over time, can develop into deeper trust encompassing affective dimensions. This process emphasizes that in virtuality, actions speak louder than words or intentions that are difficult to read. Consistency in performance and communication becomes the primary currency to purchase trust and, ultimately, cohesion. Consistency in digital behavior fosters trust and cohesion.

Individual characteristics determine adaptation and virtual team cohesion. The internal dynamics of each member also influence the process. Individuals with high self-regulation abilities, independence, and good written communication skills tend to adapt more easily to the demands of virtual work and contribute to a stable team climate. Conversely, members who are highly dependent on direct social interaction for motivation or who are less skilled at expressing themselves in writing may feel alienated and become less engaged. Therefore, the formation of cohesion also depends on the fit between individual characteristics and the demands of the virtual environment, as well as the presence of support and training to develop effective virtual communication skills. Communication support and training strengthen virtual team cohesion.

Virtual team cohesion demands conscious continuous maintenance. Cohesion in virtual teams is not a static state that, once achieved, will last forever. It is dynamic and fragile, requiring constant maintenance. Member turnover, changes in project goals, or technological shifts can disrupt the established balance. Therefore, the process of forming cohesion must be viewed as a continuous cycle rather than a straight line with an end point. Socially successful virtual teams are those whose members and leaders consciously invest time and effort to maintain relationships, renew shared commitments, and adapt to changes, using the tools and norms they built together as a flexible glue. Cohesion lasts when maintained as an adaptive cycle.

Virtual team cohesion is a continuous complex process. The formation of team cohesion in a virtual environment is a deliberate, complex, and multidimensional process. This process is heavily

influenced by the limitations and opportunities of digital media, requires proactive leadership as an architect of interaction, and relies on the strategic selection and use of communication technology. Trust building is cognitive first, based on evidence of reliable behavior. Team identity must be constructed symbolically through shared narratives and practices. Although the stages of team development remain relevant, each stage presents specific characteristics within virtuality. The cohesion formed is dynamic and requires continuous maintenance efforts, making it not a final result but an ongoing process throughout the team's life cycle. Virtual cohesion demands conscious maintenance throughout the team cycle.

### **Virtual Team Cohesion and Its Connection to Collective Performance**

The relationship between cohesion and virtual team performance is complex and contextual. The relationship between virtual team cohesion and its collective performance is a complex area of study and is not always linear or direct. Contrary to the simple assumption that higher cohesion always results in better performance, in virtual environments, this relationship is mediated and moderated by several critical factors. Cohesion, particularly task cohesion which refers to a shared commitment to work goals and objectives generally shows a more consistent positive correlation with objective performance measures. When virtual team members are collectively motivated by the achievement of group goals, they tend to be more coordinative, more willing to help overcome technical difficulties across time zones, and more persistent in facing project challenges. This commitment to shared tasks reduces the need for strict supervision because members internalize team goals as their own. They become more proactive in communicating progress and obstacles, as well as more diligent in reviewing the work of teammates, as the failure of one member is viewed as a collective failure. Thus, task cohesion serves as an effective substitute for direct managerial control, fostering independent behaviors aligned with high performance. Task cohesion becomes a substitute for managerial control in virtual teams.

The influence of social cohesion on virtual performance is ambivalent. However, the influence of social cohesion rooted in interpersonal relationships, friendship, and social attraction on performance in a virtual setting shows a more nuanced pattern. In physical environments, social cohesion often facilitates easy communication, reduces conflict, and increases satisfaction, which in

turn can boost performance. In virtual teams, while social cohesion still improves member satisfaction and retention, its impact on performance output can be hindered by media constraints. Highly socially cohesive teams might spend more interaction time on relationship maintenance through digital channels, which can reduce the time allocated to task work itself if not managed properly. Furthermore, the warmth of strong social relationships in an information-limited environment can potentially create pressure for conformity, where members are reluctant to criticize ideas or deliver bad news to preserve group harmony. This groupthink phenomenon can undermine decision-making quality and innovation, which are critical components of collective performance. Therefore, social cohesion needs to be balanced with norms that support constructive criticism and diversity of opinion. Social cohesion is effective when balanced with constructive criticism.

Cohesion reduces coordination costs in virtual teams. One of the primary mechanisms by which cohesion enhances performance is through the reduction of transaction costs in the coordination process. In less cohesive virtual teams, every interaction for coordination ranging from requesting clarification and reporting progress to resolving task dependencies can feel like a formal negotiation requiring extra effort. Distrust and uncertainty about teammates' commitment force members to over-document everything, seek layered approvals, or avoid dependencies altogether. This slows down work speed and drains cognitive energy. Poor coordination leads to various problems, including misunderstandings, requests for assistance, decreased job satisfaction among team members, and unclear tasks (de Souza Santos & Ralph, 2022). Conversely, in cohesive teams, especially those grounded in strong cognitive trust, coordination becomes smoother. Members assume their colleagues have good intentions and competence, allowing clarification requests to be made quickly via short messages without fear of misinterpretation. Status updates are trusted for their truthfulness. Flexibility in handling task dependencies emerges from the confidence that everyone will do their part. The efficiency of communication and coordination resulting from this cohesive state directly frees up resources and time that can be redirected toward more productive activities, thereby increasing the team's performance capacity. Cohesion streamlines coordination and boosts team productivity.

Communication quality serves as the bridge from cohesion to performance. The communication

quality of a virtual team functions as a critical mediating variable in the cohesion-performance relationship. Higher cohesion tends to produce communication patterns that are more open, frequent, and constructive. Team members who feel part of a tight-knit group are more likely to share relevant information, including tacit knowledge that is difficult to codify, because they trust that such information will be used for the collective benefit and will not be misused. Implementation challenges of the Job Creation Law regarding workers' constitutional rights show that legal reforms need to consider the balance between flexibility and rights protection (Suyuti et al., 2023). This rich knowledge sharing is the fuel for effective problem-solving and innovation. Furthermore, in cohesive teams, performance feedback both positive and corrective is more likely to be given and received in a productive manner. The recipient perceives the feedback as coming from a peer who cares about collective success, rather than from a hostile critic. This safe communication environment allows the team to continuously adjust their processes and outputs, which is a vital element of adaptive performance in dynamic projects. Thus, cohesion does not magically improve performance; it does so by creating a communication climate that enables knowledge to flow and errors to be corrected more effectively. Cohesion works through safe and productive communication.

Task interdependence acts as a key moderating factor in the strength of cohesion's impact on performance. In tasks with high interdependence, where one member's work is heavily reliant on another's output, the benefits of cohesion for performance are most prominent. Cohesion facilitates the timely and responsive coordination needed to manage these dependencies. The effectiveness of the Job Creation Law in guaranteeing the rights of contract workers shows that regulatory implementation still faces challenges in protecting vulnerable workers (Terubus et al., 2024). Members are more alert to their colleagues' needs and more willing to adjust their own schedules or priorities to maintain the collective workflow. Conversely, for additive or loosely coupled tasks, where each member works relatively independently and the final result is merely the sum of individual contributions, the influence of cohesion on overall performance may be weaker. In such cases, performance might depend more on individual abilities and clear task management systems than on the team's social dynamics. However, even in teams with loose tasks, cohesion can contribute to

performance by increasing intrinsic motivation and reducing the likelihood of social loafing, as members feel more accountable to the group. Cohesion is most impactful when task interdependence is high.

Temporal aspects also moderate this relationship. The benefits of cohesion for performance may not materialize immediately during the early stages of a project. Initial phases are often spent building shared understanding, trust, and work patterns processes that actually consume time and resources. The impact of the gig economy on worker welfare and labor market stability shows that this new work model brings significant consequences that must be addressed by policy (Ishaq & Darmawan, 2021). In the short term, teams highly focused on building social cohesion might even appear less productive in task output. However, this social investment can yield significant performance dividends in the later stages of the project life cycle, especially when facing crises, scope changes, or heavy deadline pressure. At such moments, a cohesive team can mobilize collective effort, adapt quickly, and support one another emotionally to overcome challenges, whereas less cohesive teams might fragment or experience a drop in motivation. Thus, assessing the cohesion-performance relationship requires a long-term perspective that considers the entire lifespan of the team, rather than just a snapshot at a single point in time. The benefits of cohesion emerge fully in a long-term perspective.

Collaboration technology strengthens both cohesion and virtual team performance. On the other hand, the role of technology once again emerges as a crucial element in overcoming these challenges. The ability of collaboration platforms to make work contributions visible and transparent can strengthen the link between cohesion and performance (Mesmer-Magnus et al., 2011). Message transparency and network transparency allow employees to easily recognize communication details and relationships among their colleagues (Pitafi et al., 2023). When all members can easily see each other's progress on digital project boards or shared documents, it creates a subtle form of team accountability. In a cohesive team, this visibility is not perceived as threatening surveillance, but rather as a source of information that enables proactive support, essentially functioning as a mechanism for building trust and coordination. A member who sees a colleague falling behind can offer assistance. Visible achievements can be celebrated, reinforcing a sense of collective accomplishment. Therefore, well-designed technology not only supports task

completion but also strengthens the positive feedback loop between visible effort, collective recognition, and ongoing commitment, all of which synergistically drive higher performance, as evidenced in research on virtual team success (Hoch & Kozlowski, 2014). Digital visibility creates accountability and reinforces cohesion.

Cohesion can support or suppress virtual team creativity. The impact of cohesion on softer performance dimensions, such as creativity and innovation, deserves special attention. A cohesive environment, when combined with psychologically safe norms, can be fertile ground for new ideas. Members feel comfortable enough to propose unrefined or unconventional thoughts without fear of ridicule. Legal protection for workers in labor crimes shows that law enforcement against violations of workers' rights still faces various obstacles (Arrosyid et al., 2024). Team psychological safety climate, cognitive motivation, and social motivation play mediating roles between shared leadership and team creativity (Sun et al., 2023). However, as previously mentioned, there is a fine line between supportive cohesion and suppressive cohesion. Virtual teams that are too homogeneous and highly socially cohesive may lack exposure to disruptive viewpoints, which are precisely what is needed for creative breakthroughs. Therefore, for tasks requiring high innovation, optimal cohesion may be that which focuses on shared goals (task cohesion) while actively managing a diversity of opinions and preventing premature consensus. Leaders need to intentionally solicit differing opinions and protect minority voices to ensure that the warmth of social relationships does not silence necessary discussion. Optimal cohesion demands shared goals and diverse voices.

Virtual team performance measurement must go beyond the final output. The measurement of performance itself needs to be carefully considered when evaluating this relationship. Virtual team performance should not be assessed solely based on final outputs or financial metrics. Process measures, such as communication efficiency, timeliness in completing stages, and the quality of collaboration in shared documents, are often more sensitive to the influence of cohesion. The legal basis for worker rights protection and employment contracts in the startup ecosystem within the era of flexible work shows that legal protections need to be adapted to the characteristics of new labor relations (Nugraha et al., 2024). Additionally, measures such as team resilience in the face of difficulties, the ability to transfer knowledge between members, and the level

of collective learning are important performance outcomes directly nurtured by strong cohesion. Cohesive teams tend to become better learning organizations because members are more motivated to share lessons learned and are more open to criticizing processes without blaming individuals. This capacity to learn and adapt is a component of sustainable organizational performance. Cohesion fosters learning capacity as sustainable performance.

Cohesion and performance reinforce each other in a reciprocal cycle. The relationship between cohesion and performance can be reciprocal. While cohesion can facilitate higher performance, the success and achievement of shared goals also act as a very powerful reinforcer of cohesion. When a virtual team achieves a significant milestone, the shared sense of pride and accomplishment strengthens the team identity and the bonds between members. The development of self-competence and supervision to achieve professionalism indicates that increasing individual capacity and good oversight are keys in every form of work relationship (Sinambela et al., 2020). Shared success experiences become part of the team narrative that reinforces commitment to future projects. This positive reciprocal cycle where cohesion enhances performance, and performance subsequently strengthens cohesion is the ideal state to be pursued. Breaking this cycle, for instance through repeated failures that are not properly reflected upon or through unfair recognition, can lead to a downward spiral where cohesion and performance weaken each other. The positive cohesion-performance cycle needs to be maintained to prevent collapse.

The cohesion-performance relationship in virtual teams is conditional and complex. The relationship between virtual team cohesion and collective performance is conditional and mediated by several mechanisms. Task cohesion shows a more direct and positive relationship with objective performance measures through improved coordination and reduced transaction costs. The influence of social cohesion is more nuanced and may depend on team norms that prevent groupthink. The primary linking mechanisms are the improvement of communication quality and efficiency, as well as more open knowledge sharing. The correlation between worker welfare and industrial relations shows that dialogue and negotiation between workers and employers are essential for creating fair working conditions (Mardikaningsih, 2021). Factors such as task interdependence, the temporal phase of the project, and the technological capabilities of the platform act

as moderators of the strength of this relationship. Performance must be viewed broadly, encompassing processes, learning, and adaptation, rather than just the final output. This relationship is reciprocal, creating the potential for positive or negative feedback cycles. This understanding leads to the conclusion that building cohesion is not an end in itself, but rather a strategic means to create the social conditions in which high performance can emerge and be sustained. Cohesion is a strategic tool for maintaining high performance.

## **CONCLUSION**

Based on the literature review conducted, it can be concluded that team cohesion in a virtual work environment is a complex and dynamic construct that can be achieved despite the inherent constraints of digital media. Its formation does not occur automatically or follow patterns identical to conventional teams; rather, it requires deliberate, structured, and sustained effort. This process is significantly influenced by the limited social bandwidth of communication tools, which hinders the flow of non-verbal cues and spontaneity, thereby slowing the development of affective trust. Successfully overcoming these barriers depends on virtual leadership acting as an architect of interaction actively designing opportunities for social engagement, establishing clear communication norms, and modeling reliability. The chosen communication media and their usage patterns especially the balance between synchronous interaction for social presence and asynchronous interaction for flexibility significantly shape the landscape in which cohesion flourishes. Cohesion in virtuality tends to be built upon a foundation of cognitive trust derived from evidence of competence and behavioral consistency, which can then evolve to encompass social dimensions. A strong team identity must be built symbolically through shared narratives, digital rituals, and deliberately created collective experiences.

This study carries several important implications for both theory and practice. Theoretically, the findings reinforce the need to develop or adapt team cohesion models that specifically account for computer-mediated conditions. Such models need to integrate variables such as media characteristics, virtual task design, and digital communication competence as antecedent factors directly influencing the cohesion process. The dimensions of

cohesion themselves may require reconceptualization to include elements such as a sense of "shared social presence" or "digital connectedness." Practically, the most immediate implication is for virtual team leaders and managers. They must shift from a role of task supervisor to a relationship facilitator and architect of the social-digital work environment. Virtual leadership training should emphasize skills in building trust from a distance, designing online meeting agendas that blend task and social aspects, and selecting technology appropriate to the team's social needs. Organizations are advised to invest not only in advanced collaboration platforms but also in the development of norms and work procedures that support transparency, collective recognition, and the formation of team identity. Collaboration software designers might consider features that actively support cohesion building, such as informal virtual spaces, peer recognition systems, or contribution visualizations that highlight teamwork rather than just individual output.

For future research, it is recommended that further studies compare the effectiveness of specific interventions aimed at increasing virtual team cohesion, such as structured virtual onboarding programs, specially designed online retreats, or the use of gamification to build togetherness. Such research could adopt experimental or longitudinal designs to isolate the impact of these interventions on both cohesion levels and performance outcomes. Another suggestion is to explore the differences in cohesion dynamics across various virtual team configurations for instance, between fully dispersed teams and hybrid teams, or short-term project teams versus ongoing teams. Additionally, research on the role of artificial intelligence and automation in mediating or facilitating the social interactions of virtual teams is an area that will become increasingly relevant. For practitioners, operational suggestions include conducting routine social check-ins at the start of every virtual meeting, creating dedicated communication channels for non-work topics, and organizing periodic team reflection sessions to discuss not only task progress but also the health of group dynamics. It is also vital to explicitly discuss and agree upon communication norms including expected response times and etiquette for providing critical feedback from the very beginning of the team's formation.

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