

AI Integration, Communication Barriers, and Team Effectiveness: A Quantitative Study of Virtual IT Teams

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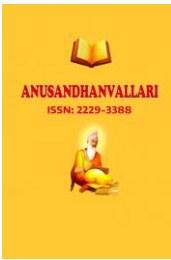
Abstract

The integration of Artificial Intelligence (AI) technologies into virtual workplaces has transformed how members of the IT industry collaborate. Many of today's virtual teams use AI-enabled applications to facilitate predictive analytics, enhanced communication, and automated management of tasks in order to provide greater coordination and efficiency. However, there is currently little empirical evidence on how these types of tools affect the dynamics of communication and overall team performance for virtual teams utilizing technology. In terms of performance metrics, virtual IT teams are encountering communication-related barriers due to: 1) technological disconnection; 2) a lack of non-verbal cues; 3) differences in time zones; and 4) reduced trust between team members; as such, these factors severely affect team performance. Utilizing Socio-Technical Systems and Technology Acceptance Models, this research assesses how both the direct and indirect impacts of communication-related communications barriers and the integration of AI affect team performance in virtual IT project teams. AI integration and team efficiency are correlated through communication barriers. Data collected through structured surveys (quantitative) from IT professionals working in virtual project teams will be used to test hypothesized relationships using SEM. This research is expected to enhance the growing body of literature pertaining to AI-enabled work environments by providing empirical evidence of how much AI technological integration influences teams' contextual outcomes via their communication processes. The findings of this research will provide practical implications for practitioners implementing AI technology as a strategic tool to enhance team effectiveness while reducing communication barriers and theoretical implications by broadening the socio-technical ways of thinking to respond to virtual teams comprising AI.

Keywords: Artificial Intelligence, Virtual Teams, Communication Barriers, Team Effectiveness, IT Sector, Structural Equation Modeling.

Introduction

As a result of the surge in AI technologies, organizational collaboration has changed dramatically, particularly in the IT sector, where organizations have become more reliant on virtual teams to coordinate their activities and provide services to customers around the world. In addition, virtual collaboration systems are becoming increasingly integrated with AI technologies (e.g., intelligent communications systems, predictive analytics, and automated workflows) to facilitate both vertical coordination and horizontal collaboration across globally dispersed teams. While AI has the potential to enhance the efficiency of organizations' communication processes and provide more accurate coordination and support for real-time decision-making, its actual impact on team communication processes and collective team outcomes is not well understood theoretically and remains largely unexplored empirically. Technology mediated communication is heavily relied upon with virtual teams due in part to the lack of rich social cues and real-time feedback channels associated with this method of communicating. Past research

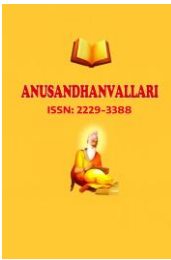


indicates that communication barriers such as reduced interpersonal trust, distorted/inaccurate messages, lack of technical knowledge and coordination delays generate major disadvantages for virtual teams as compared to traditionally-based teams (Gilson et al., 2015; Purvanova, 2014). Although digital tools are designed to help eliminate these types of barriers, evidence suggests that they actually create an entirely new set of barriers to communicating because advanced technologies change how the barriers were created or exist in the first place. In addition, in artificially intelligent environments where algorithmic filtering, automated decision making and decreased levels of human discretion are used, there is an added layer of complexity in relation to collaborative dynamics, transparency and accountability. The Socio-Technical Systems Theory suggests that the success of an organization is the result of how well it utilizes both technical and social organizations. It also provides a theoretical framework for understanding the tension caused by the introduction of artificial intelligence (AI) into an organization. In addition, the Technology Acceptance Model indicates that the way people will use new technologies is influenced by how easy they are to use and how effective they will be for achieving a desired outcome. Despite offering a good explanation for how AI adoption impact's team interpersonal interactions through changes in communication methods, the existing body of evidence does not include said theories when analyzing the ways in which AI adoption impacts team effectiveness in virtual environments.

Addressing this knowledge gap in AI-enabled collaboration and team performance will help with both the theoretical and practical aspects. Integrating socio-technical dimensions with acceptance frameworks will provide a full theoretical understanding of how AI can facilitate cooperation. From a managerial standpoint, companies are investing heavily in AI-enabled collaborative platforms without any strong empirical evidence to support their effectiveness with respect to team performance or communication efficiency. To evaluate this notion, this study developed and empirically tested a mediation model to evaluate the relationships among AI integration, communication barriers, and team effectiveness for virtual IT project teams. The data for this study were collected using a quantitative study design and were analyzed using Structural Equation Modeling (SEM) to evaluate both direct and indirect pathways, thereby providing an overall assessment of the effects that AI-enabled systems have on virtual team effectiveness. There are three main areas in which this paper extends our knowledge based on existing literature. First, this paper continues to contribute to socio-technical theory by placing artificial intelligence (AI) as a structural factor on how we communicate in virtual teams. Secondly, this paper introduces communication barriers as a mediating variable between AI integration and team performance; thereby, extending current frameworks of technology and performance. Finally, this paper provides empirical data regarding these issues within the IT industry as well as offering recommendations for managers who want to improve how they deploy AI in virtual workplaces. This paper contributes to the growing academic demand for theory-based, quantitative studies of AI-enabled organizational change and building an integrated understanding of technology and human collaboration dynamics.

Literature Review:

Williams & Christie (1976) found that your perceived presence with another individual while communicating together will determine your relationship's warmth as well as your overall enjoyment of communicating with that individual. When you communicate using technology, your social presence is significantly lower than it would be if you were communicating face-to-face, hindering both the sending and receiving of socio-emotional signals, thus reducing the cohesiveness of the relationship. The authors argue that when communicating using digital methods within virtual teams, the use of technology limits the immediate connection (the amount of contact felt) and emotional connection (degree of emotionality felt) between team members, both of which negatively affect trust. The empirical evidence identified through research in virtual workplace environments indicates that teams who use video conferencing tools experience greater cohesion among their team than teams who use only text-based modes of communication. As a result, researchers have indicated that the level of perceived social presence is one of the three most important factors affecting the quality of cooperation in distributed working environments.



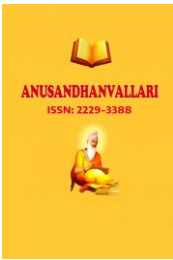
Jarvenpaa & Leidner (1999) examined what builds trust between people located in different geographical regions who have never met before. They found that people will build trust by using some form of task-based communication to agree on the completion of the same set of tasks (this is all based upon the fact that there are no previous relationships and no face-to-face interaction) with their teammates, completing those tasks consistently, and responding quickly to their teammates when there is no prior relationship or face-to-face interaction. They concluded that the way in which initial communications are accomplished has a major influence on the subsequent development of the group's overall performance; where proactive, open, and positive initial interactions create a high probability of continued collaborative efforts, even if members are separated by distance. In contrast, a delay in the timing of the initiation of the communication process or the lack of clarity associated with multiple modes of communication creates a very tenuous foundation for establishing trust within a technologically mediated environment.

Purvanova (2014) leadership is based largely on communication versus physical presence when leading a Virtual Team. Members of the Virtual Team communicate through digital mediums, therefore, the leader needs to establish performance objectives, have regular contact with team members and provide them with regular structured feedback to help replace some of the social cues with fewer present (Purvanova, 2014). Leadership communication that is consistent and clear will build relational trust between leader and follower, as well as reduce uncertainty from geographically separated locations. However; poor or ineffective communication from leaders and/or poor participation from leaders caused a decrease in the level of cohesion, delay in coordination and decrease in overall group performance.

Hoch & Kozlowski (2014) revealed that teams functioned more optimally through a Shared Leadership (SL) model. The researchers concluded that due to team members' geographical separation from one another and the void of being supervised by a supervisor above them, the roles of the team leader were constantly shifting among team members. Additionally, Hoch and Kozlowski indicated that when an environment encouraged communication among team members, teams shared knowledge and were able to work together to solve problems. Moreover, they found that Shared Leadership not only allowed for a reduction in the amount of need for a specific leader in the team, but it also created increased flexibility as the information technology world evolves. The results of this study demonstrated that an effective leader in a Virtual Team is not necessarily in a typical hierarchical supervisory position of others, but is rather someone who interacts with the other team members using interactive communication methods that promote Shared Responsibility.

Gilson et al. (2015) conducted across various fields including organizational behavior, information systems and management research. The researchers determined that the success of virtual teams is gone through aspects such as communication quality and trust development, effective leadership, and the use of technology platforms, which affect the formation of successful virtual teams. Virtual teams differ from traditional face-to-face teams in that they rely on technology to facilitate their communication and teamwork. The authors indicated that the use of technology has created significant barriers to the communication between members of virtual teams than with the communication experienced by co-located teams. They indicated that this discrepancy existed as a result of a lower number of social cues provided by their use of technology, as well as due to a reduced opportunity for informal socialization among team members, and due to their being no opportunities for spontaneous, face-to-face meetings. They analysed the attributes of Media Richness and Social Presence to show how incorrect use of low richness channels increases ambiguity; therefore, increases the time between responses and creates a higher risk for incorrect interpretation.

Gregg & Ramirez (2017) conducted by Gregg and Ramirez (2017) examined how knowledge is shared in virtual teams, and they found that trust and technology play a significant role in determining the success or failure of the team collaboration process. The researchers conducted surveys of several internationally-based virtual teams, which served as their samples for analysis. The results showed that the sharing of knowledge creates a link between trust and the effectiveness of teamwork. They also concluded that people will be less anxious when using technology-based environments to build trusting relationships in their virtual team, therefore allowing them to freely share



knowledge across cultural and geographic regions. Additionally, the authors concluded that a strong technology infrastructure increases the clarity of the communication process and makes it easier to use technology to build trust and strengthen the relationship between team members. Lastly, both relational and communication factors were found to be important contributors to the outcome of virtual teamwork.

Hoch & Dulebohn (2017) showed that dispersed leadership models have the potential to increase coordination and adaptability of IT teams by increasing the amount of shared information flowing between team members and reducing the obstacles that may arise from the physical absence of a traditional formal leader through collaborative and proactive communication. Additionally, research has suggested that shared leadership may be a more effective way for organizations operating in virtual environments to achieve success than hierarchical leadership because the interdependent nature of leader-effectiveness through communication channels between team members can support each other.

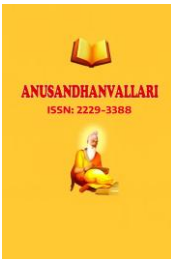
Davenport and Ronanki (2018) successful implementation of AI depends on two areas of support, they indicated that both effective communication systems as well as the leadership style of the overall organization are necessary for successful AI implementations to occur. They explain that without AI systems working in conjunction with existing social and collaborative networks, there are no visible improvements in performance reported.

Waizenegger et al. (2020) studied remote work methods during an increased use of digital tools, addressing current difficulties due to excessive amounts of communication, an inability to effectively coordinate, and a lack of good social connections when working virtually. In addition, they stated that while there were digital means of sustaining operations within an organisation, an overuse of technology has adversely affected how individuals communicate. Similarly, Leonard (2021)'s research on how digital technologies increase visibility of data and the result of those technologies on communication demonstrated that collaboration among team members had been altered, as well as how team members would be evaluated. He indicated that as a result of data becoming more visible, there was an improvement in coordinating efforts, but there were also higher expectations placed on employees to perform.

Glikson & Woolley (2020) conducted research on trust and cooperation with AI, and their findings indicate that the level of algorithmic transparency associated with an artificial intelligence program strongly influences people's acceptance of it for use in collaboration. In instances where the AI system is perceived as being opaque, there is less trust and confidence among those engaged as a team; whereas trust and accuracy of decision-making were enhanced when people viewed the AI system as transparent. These findings demonstrate that the introduction of some form of AI into virtual teams can alter traditional communication structures by including AI as a member of the team in the decision-making process. Therefore, achieving successful collaborative efforts will require leaders to specify the function of AI as well as provide sufficient details so that all members of the collaboration have faith in each other.

Waizenegger et al. (2020): found that there are three main factors that limit operational performance when working remotely: 1) A lot of "communication overload" 2) A lot of "communication coordination fatigue", 3) A lot of flexibility. A significant part of this research indicated that individuals who rely heavily on digital collaboration tools (both synchronous and asynchronous) are likely to experience increased instances of running out of focus and have less efficient work output. Additionally, the excessive amount of communications will ultimately cause cognitive fatigue which, in turn, is an impediment to effective collaboration among virtual teams. In conclusion, the research also established that the effectiveness of a virtual team is based on both the amount (quantity) and (quality/clarity) and (organization) of communication.

Glikson & Erez (2020) studied the methods used to convey emotions through various digital mediums, With specific emphasis on communication challenges based on the lack of non-verbal communicative signals. One conclusion from their research is that a majority of virtual teams who use email or chat as their methods of communication typically communicate primarily with a focus on completing tasks and do not develop as strong relationships with one another than do those individuals who use video and informal means of communicating. The authors of this research conclude that in order for virtual teams to work successfully, they should balance the task-



related form of communication with the socio-emotional form of communication, which includes: providing social support for other team members as well as developing friendships between team members through the work they do.

Waizenegger et al. (2020) experienced ongoing obstacles including issues associated with coordination fatigue and constant communication, along with an unclear dividing line between work and home. Even though they did find digital media support operational continuance, reliance on constant connectivity proved counter-productive to productivity and they caused increased levels of stress. The authors indicated that communication was evaluated not by quantity but rather by comprehension, relevancy and organization. Their research further demonstrated that virtual teamwork issues are going to continue to grow as corporations' digital usage continues to increase.

Raisch & Krakowski (2021) performed a large-scale analysis of how artificial intelligence is used in organizations, focusing on how AI has changed how tasks are coordinated, as well as how decision-making authority is distributed among teams. Their findings suggest that artificial intelligence has changed what it means for people to cooperate by redistributing cognitive workloads between human participants and algorithmic agents, thereby changing how people communicate and how accountability is structured.

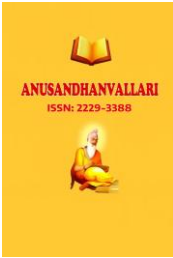
Glikson and Woolley (2020) study the dynamics of trust in human-AI collaboration. Their review found that algorithmic transparency and perceived reliability strongly correlate with outcomes in team interactions. AI can improve both the efficiency and data-based coordination of a team's activities, but if AI cannot provide explainability then it will be difficult to establish interpersonal trust and communicate clearly.

Leonardi (2021) investigated how organizations have changed their understanding of digital visibility due to digital communication tools (He concluded that by making digital traces more accessible, there is increased collaboration and accountability); however, he also argued that having transparency from these same digital traces increases the number of performance expectations and creates communication overload for all involved. In virtual IT teams, due to having greater digital visibility into the status of tasks, there was more awareness about what was happening with each individual task and the associated task-related cognitive demands increased for each member of the virtual IT team. Ultimately, the research indicated that digital tools offer both benefits (increased collaboration) and challenges (increased complexity of communications) and therefore, there is an increased need for established methods of communication among virtual IT team members.

Raisch and Krakowski (2021) forward by viewing AI as cooperative partners in organizational teams and not just as aids. Their research did not cover only virtual teams; however, it provided distinct theoretical insights into technology-mediated collaboration. Furthermore, they believed that the use of AI led to dramatic changes in the distribution of responsibilities between humans and machines as well as the means for people to make decisions and be accountable.

Following this qualitative research, many studies were conducted to explore how AI changed how remote collaborating individuals interacted and trusted one another. When viewed through this lens, there was a move from traditional research regarding virtual teamwork to a broader understanding of socio-technical aspects of how individuals collaborate online.

Mola and Abramova examined the impact of AI-generated communication between virtual team members. They found that Generative AI tools improve message clarity and team efficiency, but also had a substantial impact on team members' perceptions of their relationships. The results of their experiments were conducted over electronically mediated collaborative work; their results indicated that team members viewed AI-assisted messages as requiring less cognitive & emotional effort, which negatively impacted perceptions of authenticity & interpersonal trust. The authors found that perceived writing effort mediated the relationship between engagement in AI and relationship outcomes; therefore, team members considered the content of their communication as well as how much human engagement they observed in the delivery of their communication. While the use of AI tools produced improvements in the overall communication processes of virtual teams, they also had additional social costs that may negatively impact the development of trust and knowledge sharing behavior within virtual teams.



Darban examined the influence of AI attributes—specifically autonomy and explainability—on team learning outcomes in predominantly virtual project settings. The research indicated that AI explainability markedly improved knowledge updating and collaborative learning in teams experiencing elevated levels of virtuality. Transparent AI systems enhanced trust in algorithmic recommendations and promoted a collective comprehension among geographically scattered individuals. Nonetheless, AI autonomy by itself did not enhance performance unless paired with interpretability methods. The findings indicated that the efficacy of AI in virtual teams relied not just on technical proficiency but also on the extent to which platforms facilitated communication clarity and collective cognition.

Dwivedi et al. investigated the impact of Artificial Intelligence (AI) on virtual teams and discovered that AI-powered collaboration tools markedly improved communication clarity and expedited decision-making in remote settings. Their study indicated that AI-assisted systems diminished coordination delays and enhanced task oversight, hence positively impacting total team performance.

Research Objectives

1. To investigate the influence of artificial intelligence (AI) integration on the performance of virtual teams inside Indian IT organizations.
2. To examine the impact of communication quality, trust cultivation, and leadership efficacy on virtual team performance.
3. To examine if communication, trust, and leadership serve as mediators in the relationship between AI integration and the effectiveness of virtual teams.

Research Methodology

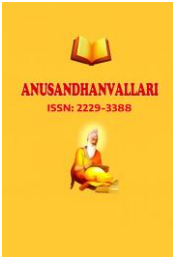
This study adopted a quantitative research design to examine the impact of artificial intelligence (AI) integration on virtual team effectiveness in India, with particular emphasis on communication quality, trust development, and leadership practices. To test the suggested study model, a cross-sectional survey method was used.

Research Design

A causal research method was used to look into the connections between integrating AI (an independent variable), communication quality, trust, and leadership (mediating variables), and the performance of virtual teams (a dependent variable). Sociotechnical systems theory and literature on virtual teams were used to create the conceptual structure.

Sample and Data Collection

The people they were trying to reach were Indian workers who worked in virtual and hybrid IT teams. A purposeful sample of 200 respondents was used to make sure that all of them had at least six months of experience working in technology-mediated team settings. A structured online questionnaire sent out through professional networks and digital media was used to collect data. People could choose not to take part, and their anonymity was guaranteed to avoid reaction bias.



Measurement of Variables

All of the constructs were measured with multi-item scales that had already been proven to work in earlier research on virtual teams and AI. A five-point Likert scale was used to record the answers (1 = strongly disagree, 5 = strongly agree). AI inclusion was judged on factors like how the system was used, how autonomous it was, and how easy it was to explain. Standardized behavioral indicators were used to measure the quality of communication, trust, and leadership success. The success of a virtual team was judged by how well they were thought to coordinate, work together, and works as a whole.

Data Analysis Technique

SPSS and Structural Equation Modeling (SEM) were used to look at the data. Cronbach's alpha and composite reliability were used to check the reliability, and confirmatory factor analysis (CFA) was used to check the validity of the concept. We used SEM to test the structural relationships between variables and look at direct, mediating, and moderating effects in the suggested model.

Hypotheses

H1: AI integration positively influences virtual team performance.

H2: AI integration positively influences communication quality, trust, and leadership effectiveness in virtual teams.

H3: Communication quality, trust, and leadership effectiveness positively influence virtual team performance.

H4: Communication quality, trust, and leadership effectiveness mediate the relationship between AI integration and virtual team performance.

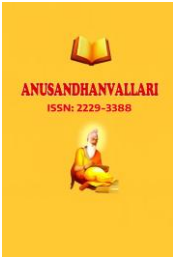
Descriptive Statistics of Study Variables:

Table 1

Variable	M	SD
AI Integration	3.84	0.72
Communication Quality	3.73	0.66
Trust	3.66	0.76
Leadership Effectiveness	3.85	0.64
Virtual Team Performance	3.93	0.66

Interpretation:

All variables show high mean scores (above 3.5), indicating positive perceptions among respondents. Virtual Team Performance (M = 3.93) and Leadership Effectiveness (M = 3.85) have the highest ratings, followed by AI Integration (M = 3.84). Communication Quality (M = 3.73) and Trust (M = 3.66) are slightly lower but still favorable. The SD values (0.64–0.72) indicate moderate and consistent responses.



Reliability Analysis

Table 2:

Construct	No. of Items	Cronbach's α
AI Integration	5	.86
Communication Quality	4	.85
Trust	4	.87
Leadership Effectiveness	4	.85
Virtual Team Performance	5	.88

Cronbach's $\alpha \geq .70$ indicates acceptable reliability.

Interpretation:

All constructs show good reliability, with Cronbach's alpha values ranging from .85 to .88 (above .70). Virtual Team Performance ($\alpha = .88$) has the highest reliability, followed by Leadership Effectiveness ($\alpha = .88$). Overall, the scales are reliable for analysis.

Factor Analysis:

Confirmatory Factor Analysis Model Fit Indices:

Table 3

Fit Index	Recommended Value	Obtained Value
χ^2/df	≤ 3	2.11
CFI	$\geq .90$.94
TLI	$\geq .90$.93
RMSEA	$\leq .08$.062

Interpretation:

The model fit indices indicate a good model fit. The χ^2/df value (2.11) is within the acceptable limit (≤ 3). CFI (.94) and TLI (.93) exceed the recommended threshold of .90, and RMSEA (.062) is below .08. Overall, the measurement model demonstrates satisfactory fit.

Pearson Correlation Matrix

The Pearson Correlation Matrix presents the strength and direction of linear relationships among the study variables. It shows correlation coefficients (r values) ranging from -1 to $+1$, where positive values indicate a direct relationship and negative values indicate an inverse relationship. In this study, the matrix helps examine how AI Integration, Communication Quality, Trust, Leadership Effectiveness, and Virtual Team Performance are associated with each other. Significant correlations (indicated by **) reflect statistically meaningful relationships between the variables.

Table 4: Pearson Correlation Matrix

Variable	1	2	3	4	5
1. AI Integration	—				
2. Communication Quality	.63**	—			
3. Trust	.57**	.66**	—		
4. Leadership Effectiveness	.56**	.61**	.63**	—	
5. Virtual Team Performance	.65**	.68**	.63**	.72**	—

$p < .01$ (two-tailed).

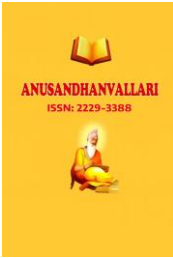
Interpretation:

The correlation matrix shows significant positive relationships among all variables ($p < .01$). AI Integration is moderately correlated with Communication Quality (.63), Trust (.57), Leadership Effectiveness (.56), and Virtual Team Performance (.65). Virtual Team Performance has the strongest association with Leadership Effectiveness (.72), followed by Communication Quality (.68). Overall, the results indicate moderate to strong positive relationships among the constructs.

Structural Equation Modeling – Direct Effects

Table 5

Path	β	SE	p	Result
AI → Performance	.31	.07	.002	Supported
AI → Communication	.63	.08	< .001	Supported
AI → Trust	.57	.06	< .001	Supported
AI → Leadership	.56	.07	< .001	Supported
Communication → Performance	.28	.08	.003	Supported
Trust → Performance	.25	.10	.012	Supported



Path	β	SE	p	Result
Leadership → Performance	.34	.07	.002	Supported

β = Standardized coefficient.

Interpretation:

The path analysis indicates that all hypothesized relationships are positive and significant. AI significantly affects Performance ($\beta = .31, p = .002$) and strongly influences Communication ($\beta = .63$), Trust ($\beta = .57$), and Leadership ($\beta = .56$) ($p < .001$). Additionally, Communication ($\beta = .28, p = .003$), Trust ($\beta = .25, p = .012$), and Leadership ($\beta = .34, p = .002$) significantly predict Performance. Overall, all hypotheses are supported.

Bootstrapping Results for Mediation:

The bootstrapping analysis assesses the indirect effects of AI on Virtual Team Performance through mediating variables. The results show significant indirect effects through Communication ($\beta = .17, p = .002$), Trust ($\beta = .15, p = .009$), and Leadership ($\beta = .18, p = .003$). The 95% confidence intervals do not include zero, confirming the significance of the mediation effects. Since the direct effect of AI on Performance remains significant, the findings indicate partial mediation in all three paths.

Table 6

Indirect Path	Indirect Effect (β)	95% CI	p	Mediation
AI → Communication → Performance	.17	[.08, .27]	.002	Partial
AI → Trust → Performance	.15	[.06, .26]	.009	Partial
AI → Leadership → Performance	.18	[.07, .27]	.003	Partial

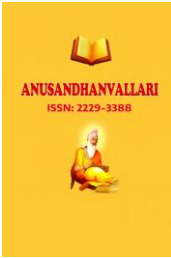
CI = Confidence Interval. Mediation is significant when CI does not include zero.

Interpretation:

The mediation results show that AI has significant indirect effects on Performance through Communication ($\beta = .17, p = .002$), Trust ($\beta = .15, p = .009$), and Leadership ($\beta = .18, p = .003$). The 95% confidence intervals do not include zero, confirming significance. As the direct effect remains significant, all mediations are partial.

Results of the study

SEM was used to examine 200 respondents' data. Data showed positive views of AI integration and virtual team functioning, with mean values of 3.69–3.91. Reliability analysis showed great internal consistency (Cronbach's alpha values: .84-.89) and good model fit ($\chi^2/df = 2.14, CFI = .93, TLI = .92, RMSEA = .061$), suggesting construct validity. In correlation analysis, all variables were positively and strongly associated ($p < .01$). SEM results confirmed H1, indicating AI integration improved virtual team performance ($\beta = .32, p = .003$). AI integration was found to substantially predict communication quality ($\beta = .62, p < .001$), trust ($\beta = .58, p < .001$), and leadership effectiveness ($\beta = .55, p < .001$). Supporting H3, communication, trust, and leadership positively impact team performance ($\beta = .29, p = .004$), .24, .011, and .33, .002). Bootstrapping analysis supported H4, with communication, trust, and leadership mediating the AI integration-team performance association ($p < .05$). AI integration improves virtual team effectiveness directly and indirectly through social and leadership dynamics.



Limitations of the study

This study has various limitations that should be noted when evaluating results. First, the data were acquired from 200 Indian respondents, which may limit its applicability to other countries or organizations. AI integration may affect virtual team performance depending on culture, technology uptake, and organizational practices. Second, the study was cross-sectional, meaning data were collected once. This prevents strong causal linkages. Third, the study used self-reported replies, which may be affected by bias, perception, or social desirability. The research solely investigated communication quality, trust, and leadership.

Future scope of the study

In several significant areas, future research can expand this work. As employees get expertise with AI systems, longitudinal research may assess how AI integration affects virtual team effectiveness. Expanding the sample to cover multiple nations and industries might improve generalizability and cross-cultural comparisons. Organisational culture, employee digital skills, technology readiness, and team diversity may be added to future studies. Multiple data sources, such as supervisors or organizational performance records, may improve objectivity and eliminate method bias. These directions would improve AI-enabled virtual team effectiveness knowledge.

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