

Developing the conceptual framework for factors influencing virtual team collaboration in the “new normal” era

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Abstract:

Remote working has become more prevalent in many firms as a result of digitization and global company expansion. While there are many studies in traditional management research mentioning collocated team cooperation, there is a lack of study on variables impacting team collaboration in the virtual environment, particularly during the “new normal” period. The purpose of this paper is to provide a comprehensive conceptual model of the elements influencing the quality of virtual team collaboration. Four hypothesis and four accompanying factors are proposed including trust and interpersonal relationships, shared understanding, e-leadership, and collaborative technology, in which e-leadership and collaborative technologies are two emerging factors. This conceptual model helps future researchers conduct empirical research that improves the current understandings of antecedents of remote collaboration. For practitioners, better insights into which components contribute to disperse team cooperation helps business leaders and teleworkers enhance team performance in virtual settings.

Keywords: Virtual team, collaboration, team performance.

1. Introduction

As a result of a globalized and digitalized business model, remote working has emerged worldwide in recent decades (Choudhury, 2020; Sawhney, 2021). With fierce competition, financial pressures, changing demographics, and the advancement of ICT technology, corporations have built virtual teams where employees from many geographical locations and time zones utilize ICTs to collaborate and achieve common goals (Chamakiotis et al., 2021; Gilson et al., 2015). Work-from-anywhere practices provide significant benefits to both businesses and employees, including reduced operating expenses, commuting time, and air pollution, as well as access to a worldwide talent pool for a greater range of expertise and compensation levels (Akbari and Hopkins, 2019; Felstead and Henseke, 2017; Sawhney, 2021). It is also suggested that remote working increases job performance, satisfaction,

and work-life balance, lowering stress levels and staff turnover rates (Contreras et al., 2020; Garro-Abarca et al., 2021; McKendrick, 2020). During and after the Covid-19 pandemic, hundreds of millions of workers must adjust to new teleworking practices, and it is evident that remote working has become an inevitable trend today.

The quality and performance of remote working differ from company to company depending on the degree of digitalization, type of work, industries, and employees' teleworking experience (Chudoba et al., 2005; Garro-Abarca et al., 2021). On the one hand, according to a recent poll of 9,000 managers and employees in Europe conducted by Boston Consulting Group, Microsoft, and KRC Research, 81 percent of workers believed that their productivity was the same or higher during remote work times (McKendrick, 2020; Parke, 2020). Managers also reported increased staff retention and satisfaction

due to the dispersed work mode's flexibility (McKendrick, 2020; Sawhney, 2021). However, the ability to collaborate among team members in a virtual environment has been identified as one of the significant downsides of remote work. The reason for this limitation is that many factors contributing to team collaboration performance in a collocated setting are difficult to obtain in a remote context. First, owing to geographical/temporal disparities, virtual teams frequently connect via ICT tools; as a result, people find it harder to create rapport and professional relationships, resulting in a lower degree of trust (Morrison-Smith and Ruiz, 2020; Peters and Manz, 2007). Remote communication also restricts employees' interpersonal relationships and capabilities to exchange information, express emotions, and communicate nonverbally, leading to misunderstanding and frustration (Choudhury, 2020; Kahai et al., 2007). Furthermore, after a lengthy period of working from home, teleworkers often experience isolation and loneliness, which causes personal stress, poor social relationships, and reduced team spirits (Charalampous et al., 2019; Galanti, 2019). To sum up, although remote working brings significant benefits to workers and businesses, team collaboration in virtual teams is still a serious concern for today's managers.

While team collaboration is not a new topic in management literature, research on a conceptual framework of factors influencing team collaboration in a virtual setting is very limited. Before the Covid-19 epidemic, many organizations formed distance teams to carry out a small number of specific tasks (Gilson et al., 2015). Most empirical research in virtual team collaboration has been undertaken in a university or software development firm due to the convenience and availability of participants (Contreras et al., 2020; Garro-Abarca et al., 2021; Karoui et al., 2010). However, after the Covid-19 epidemic, everyone in every sector, organization, and task/project has had the opportunity to work remotely. Furthermore, with the rapid development of new ICTs, video-conferencing software, and social business applications (e.g., intranet social web, virtual office gamification), more empirical research is needed to analyze the impact of these modern technologies on remote workers. All in all, the researcher argues that previous research on

antecedents of remote team collaboration is outdated due to the increased popularity of teleworking, innovation, and advanced ICTs. Therefore, this article aims to establish a comprehensive model of the antecedent of remote team collaboration by answering the following research question: "What are the factors influencing virtual team collaboration in the new "normal" situation?"

This article is organized into five parts: after the introduction, the researcher has presented the most up-to-date literature review on relevant topics. Subsequently, a conceptual framework of factors influencing remote collaboration is proposed with four factors: trust-interpersonal relationships, shared understanding, e-leadership, and collaborative technologies. Lastly, the researcher has discussed the applications of the model and future research directions before several concluding remarks.

2. Literature review

2.1 Team and collaboration

Teams are groupings of individuals that collaborate to achieve common goals and objectives (Kirkman and Rosen, 1999; Klimoski and Mohammed, 1994). Team members typically share missions, visions, and fundamental values such as working methods, ethics, beliefs, and standards (Karoui et al., 2010). Obviously, teamwork is essential for every organization, and collaboration is one of the most important variables influencing team effectiveness (Gilson et al., 2015; Karoui et al., 2010).

Traditionally, team collaboration is described as a group of individuals' collaborative efforts and actions to achieve common corporate goals (Cramton, 2001). Each team member has a unique skill set that supports the team in overcoming obstacles, solving difficulties, coming up with new ideas, and improving overall team performance (Karoui et al., 2010). Successful team collaboration provides significant benefits to both teams and businesses. Because individuals may optimize their abilities and create high-quality outputs, a collaborative team frequently generates higher productivity and better creativity (Garro-Abarca et al., 2021). Collaboration also increases people's engagement and innovation and reduces stress and frustration (Choudhury, 2020). A firm with a collaborative culture usually has higher retention

rates, a better worker well-being index, and attracts high-skilled individuals (Garro-Abarca et al., 2021; Gilson et al., 2015).

2.2 Traditional and virtual organizations

Virtual teams, in general, are a group of people located in separate geographical and temporal places who use computer-mediated technology to collaborate and complete business tasks and projects (Chamakiotis et al., 2021; Charalampous et al., 2019; Gilson et al., 2015). As a result of globalization, ICT advancements, and the Covid-19 pandemic, companies nowadays operate worldwide, with virtual teams working from various locations. Communication, relationships, trust, reward, cohesiveness, and collaboration are all critical attributes in virtual team performance (Garro-Abarca et al., 2021; Tan et al., 2019). Because of the significant differences in company structure, managing remote teams and boosting team performance in a virtual setting are very different from a collocated workplace (Peters and Manz, 2007).

Traditional business environments are commonly more hierarchical, centralized, and formal in nature (Allcorn, 1997). To build homogenous groups, each member stays in the same location and communicates face-to-face. Because of the nature of the distributed workforce, virtual organizations have a flatter, more decentralized, more informal structure (Cortellazzo et al., 2019). Aside from regular meetings through video-conferencing programs (synchronous), the majority of communication in virtual teams is asynchronous from people in various areas, time zones, cultures, and languages, leading to significant heterogeneity in the teams (Morrison-Smith and Ruiz, 2020). Asatiani and Penttinen (2019) and Peters and Manz (2007) both noted that building mutual trust, professional rapport, and shared understandings in a distant environment is substantially more difficult. Given these challenges, communication and collaboration in remote teams are always seen to be less effective than face-to-face counterparts (Morrison-Smith and Ruiz, 2020). This offers up a viable study field for academics and practitioners interested in developing a collaborative atmosphere in dispersed teams (George et al., 2020).

3. Hypothesis development for the conceptual framework

In this section, the researcher has presented several important factors influencing virtual team collaboration to develop four hypotheses.

3.1 Trust and interpersonal relationships

The ability to believe in someone's honesty and faithfulness is characterized as trust (Cummings and Bromiley, 1996). Trust reflects positive expectations on someone to do the right thing and not take advantage of opportunistic situations (Choi and Cho, 2019). Integrity, competence, and ethics are all aspects of trust (Breuer et al., 2016). In the remote working environment, direct control and supervision from leaders to team members is challenging to achieve owing to remote location and asynchronous communication (Contreras et al., 2020). Thus, trust amongst team members is even much more critical than in collocated teams (Morrison-Smith and Ruiz, 2020).

Cognitive-based trust is the first necessary type of trust: confidence in team members' technical and professional abilities to perform tasks (Sarker et al., 2003). This trust is often constructed during team history since other members are aware of an individual's prior successes and may place their trust in future performance (Peters and Manz, 2007). Personality-based trust is another sort of trust: favorable expectations about someone's qualities and moral standards (Mayer et al., 1995). Finally, institution-based trust is faith in an individual's commitment to follow organizational rules and cultures and work in the corporation's interests rather than its own (Scott, 1987). Taken together, due to the vulnerability of opportunistic actions from dispersed teams, trust is an essential element of virtual team collaboration (Choi and Cho, 2019).

Interpersonal relationships among team members are another factor that contributes to team collaboration (Peters and Manz, 2007). Because of the lack of team familiarity, dispersed teams experience difficulties in developing trust and working relationships. Geographical dispersion and asynchronous communication make it harder for team members to comprehend and create professional rapport, mainly with cultural differences or conflict situations (Breuer et al., 2016; Choi and

Cho, 2019). Therefore, face-to-face interactions are recommended at the first stage of virtual teams to develop trust and working connections (Karoui et al., 2010). Furthermore, previous experience working with someone also promotes interpersonal relationships (Hertel et al., 2005). According to the importance of trust and interpersonal relationships, we propose the first hypothesis:

Hypothesis #1: A higher level of trust and interpersonal relationships in a virtual team positively affects team collaboration.

3.2 Shared understanding

Another crucial aspect of virtual team cooperation is shared understanding. When all team members agree on the team's strategic goals and objectives, everyone will act by the team's ultimate visions and values to generate the most outstanding results (Gressgard, 2011; Liedtka, 1996). Moreover, shared understanding entails understanding each member's abilities and expertise, allowing leaders to assign the most appropriate duties to members in order to enhance collaborative performance. Shared understanding enables teams to leverage the collective strengths of all individuals while working together to accomplish common goals (Peters and Manz, 2007; Watkins, 2013).

The degree of shared understanding is frequently determined by the team's history and the task's complexity. In terms of team history, the longer the team has worked and trained together, the more the team understands each other and leverages collective capabilities (Gressgard, 2011; Hertel et al., 2005). This also underscores the need for early face-to-face interactions in team collaboration (Garro-Abarca et al., 2021; Morrison-Smith and Ruiz, 2020). More crucially, task complexity is another component of shared understanding since the more complicated the tasks, the greater the team understanding required to achieve the goals (Bell and Kozlowski, 2002; Karoui et al., 2010). Because of the nature of the complex working activities, the team has to deal with critical issues and make difficult decisions; hence, shared understanding and collaboration are even more critical in this sense. To sum up, we can propose the second hypothesis:

Hypothesis #2: A higher level of shared understandings in virtual teams positively affects team collaboration.

3.3 E-leadership

Leadership is described as the leader's social influence on teams in order to achieve corporate goals (Bell and Kozlowski, 2002; Chamakiotis et al., 2021). To achieve the best results, leadership is also an interactive process between leaders and teams for allocating tasks, motivating, giving and getting feedback, understanding people, and overcoming challenges (Contreras et al., 2020; Cortellazzo et al., 2019).

Organizational structures are often fatter and more decentralized in the context of a dispersed workforce (Contreras et al., 2020). The rise of cloud computing and ICTs has increased the level of connectivity within organizations, allowing everyone to have better access to information. Team members from many places can participate in participative decision-making processes, allowing teams to efficiently analyze large amounts of data, react faster, and innovate more effectively. As a result, team power is spread more evenly, reducing organizational borders and team hierarchies (Cortellazzo et al., 2019). As a result, virtual teams have been advised to adopt shared leadership to effectively utilize members' knowledge, with rotating leadership responsibilities among members (Chamakiotis et al., 2021; Karoui et al., 2010). However, it's worth noting that teleworking mode poses a number of significant issues for leaders in terms of communication, supervision, performance management, training, and team cooperation (Flood, 2019). To overcome these obstacles, effective remote leading techniques require a new leadership strategy in the virtual setting, often known as e-leadership (Darics, 2020). To improve mutual understanding, flexible communication between synchronous (audio/video conferencing) and asynchronous (emails/messages) modes is required (Contreras et al., 2020; Darics, 2020). Furthermore, since the "finger-attendance-check" makes no sense in the remote working setting, another way to assess employees' performance based on results is critical (Darics, 2020). Finally, promoting e-collaboration in virtual teams necessitates a completely new skillset for leaders (Chamakiotis et al., 2021; Gressgard, 2011).

While leadership is a well-studied topic in management field, e-leadership in the dispersed

workforce is relatively new, particularly in terms of promoting e-collaboration. To encourage virtual team collaboration, Van Wart et al. (2017) proposed four critical competencies for e-leaders. To begin with, e-leaders' communication and social skills must be clear and helpful to members while using proper communication technologies. Effective communication allows teams to understand one another better, solve difficulties, and make more informed decisions (Van Wart et al., 2017). Social skills can assist leaders in deploying emotional intelligence to guide teams through obstacles, such as resolving disagreements in working styles and cultural differences (Mysirlaki and Paraskeva, 2020). Second, e-leaders must be capable of forming and leading teams. Leaders play a critical role in facilitating the development of a healthy, collaborative team atmosphere in which everyone is free to share ideas, express feelings, and feel a sense of responsibility (Karoui et al., 2010; Van Wart et al., 2017). Participants are also motivated by the collaborative atmosphere, which acknowledges their efforts and accomplishments. Team-building skills of leaders also help to create work-life balance, boost employee well-being, and establish professional rapport (Cortellazzo et al., 2019). Furthermore, as team builders, e-leaders assist the team in developing a strong sense of integrity, fairness, honesty, consistency, and diversity respect (Van Wart et al., 2017).

When it comes to each member's responsibilities in virtual teams, the boundaries are frequently blurred (Contreras et al., 2020). Assigning tasks and delegating employees are therefore essential skills for e-leaders in order to make remote cooperation productive, clear, and efficient. It is obvious that e-leaders must have a thorough understanding of the business process, problems, and workload in order to assign tasks to colleagues fairly and appropriately (Morgan et al., 2014; Zhang et al., 2006). More importantly, each team member's task and effort must be documented so that everyone may refer to it when needed. By documenting all procedures, each member's effort/workload can be clearly identified, and mistakes/misunderstandings may be identified early (Arneson, 2021). In this case, using advanced project management software and cloud storage services is typically a suitable

choice for the remote team.

Next, because change is unavoidable, e-leaders must develop the skill of change management. New visions and short-term goals must be clearly conveyed to subordinates during the transformation process. Team disputes and resistance to change are also inescapable repercussions that must be addressed by all team members (Van Wart et al., 2017). Changemanagement is particularly important for promoting innovation and creativity, which are frequently more difficult to achieve in remote work contexts (George et al., 2020; Gressgard, 2011). Finally, while e-leaders are not necessary tech gurus, they must have a thorough understanding of collaborative technology, including which tool to use and when to use it to maximize coordination efforts (Contreras et al., 2020; Morrison-Smith and Ruiz, 2020). All in all, we propose the third hypothesis:

Hypothesis #3: A higher level of effectiveness of e-leadership in virtual teams positively affects team collaboration

3.4 Collaborative technologies

Collaborative technology is a critical aspect impacting team collaboration since virtual work is dependent on computer-mediated platforms (Neeley, 2021). E-leaders are frequently faced with two questions: how to select the appropriate technologies and how to apply them effectively (Hill and Bartol, 2018; Karoui et al., 2010; Laitinen and Valo, 2018). Companies frequently set up cloud-computing tools alongside Enterprise resource planning systems (ERP) to perform properly in remote teams, with the majority of corporate data and processes being accessible and used from the cloud (DeRamus, 2020; Hider, 2020). Because of the scope of this study, we will not explore these complicated systems, instead of focusing on the daily collaboration systems utilized by virtual teams.

When it comes to selecting the right collaboration software, there are various elements to consider, including pricing, availability, usability, security, and collaborative capabilities (Correia et al., 2020; Rennar-Potacco and Orellana, 2018). While many communication tools, such as email and videoconferencing, are free, upgrading to premium versions frequently comes at a cost.

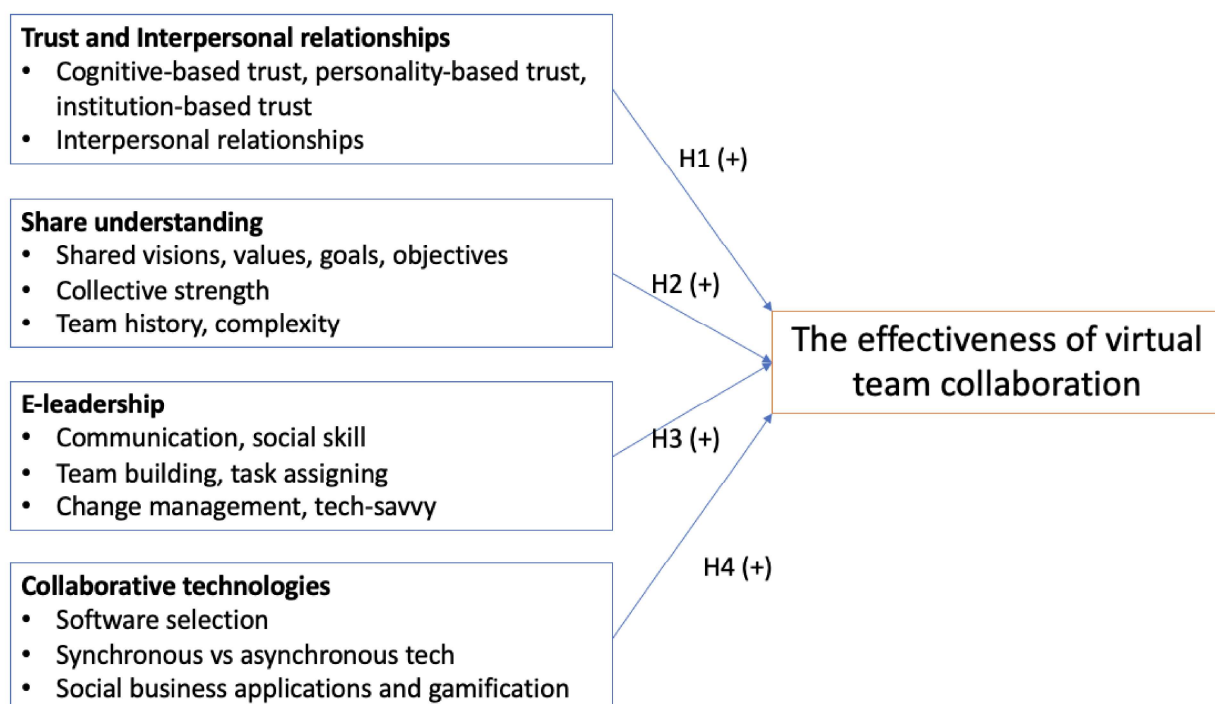
Before acquiring business versions, firms usually consider the costs and benefits (McLaughlin and Brame, 2021). Another aspect is a wide variety of availability across multiple platforms (Windows/macOS/Android/iOS) (Drake and Turner, 2021). Furthermore, software usability is determined by factors such as ease of use, training duration, and performance reliability (Seffah et al., 2006). Because of private data and the increased incidents of hackers in the online environment, data security and user privacy are also important (O’Flaherty, 2021). Finally, it is clear that businesses should adopt ICTs with collaboration capabilities to enhance team coordination. Many video conferencing software, for example, allow users to share screens, operate other people’s computers remotely, and share files and documents quickly (Correia et al., 2020; McLaughlin and Brame, 2021). During video-based meetings, a virtual whiteboard with many remote editors can help teams develop innovative ideas and solve challenging problems (Rennar-Potacco and Orellana, 2018).

There are two types of technologies that may be used to operate remotely: synchronous and asynchronous technologies that serve different purposes (Laitinen and Valo, 2018; Neeley, 2021).

Members of synchronous technology frequently utilize audio or video conferences to obtain rich media and instant replies from peers (Karoui et al., 2010). Synchronous media is ideal for frequent team meetings, rapport building, and social connections among team members (Laitinen and Valo, 2018). This sort of immediate technology is great for participative decision-making processes, discussing challenging problems, and providing critical feedback (Cortellazzo et al., 2019). In the event of an emergency or a corporate crisis, an audio/video conference is required to attract instant attention and handle the situation as soon as possible. Asynchronous communication (email/messages), on the other hand, is appropriate when the staff does not require immediate replies. Suppose there is a large quantity of information or data. In that case, it is best to share asynchronously so that our colleagues have time to absorb it and utilize it for future references (Neeley, 2021). If your teammate is in a different time zone, asynchronous media should be utilized for most business topics, with the exception of urgent situations or business meetings (Hill and Bartol, 2018).

Social business applications have emerged as a major trend in collaborative technology in virtual

Figure 1. The framework of factors influencing virtual team collaboration



enterprises in recent years. Many businesses utilize intranet and social media platforms to encourage workers to share their work-life balance experiences in order to boost team spirit and social interactions (Jarrahi and Sawyer, 2013; Kirkland, 2013). Other companies utilize gamification to create virtual workplaces, where employees can see themselves in these 3D-modeling offices, enjoying coffee breaks and chit-chatting before attending meetings (Mascarenhas, 2021). To summarize, knowing and keeping up with the evolution of collaborative technologies is essential for teleworkers to achieve a competitive edge from virtual teaming over conventional collocated peers. We propose the following hypothesis:

Hypothesis 4: The better use of collaborative technologies in virtual teams positively affects team collaboration.

Taken all together, based on these hypotheses, the researcher put together the research model as the conceptual framework of factors impacting the effectiveness of virtual team collaboration (Figure 1).

4. Application of the research model and future directions

4.1 Applications of the research model

The main application of this research model is a helpful reference for future academicians to conduct quantitative research. This research intends to improve our current understanding of factors that affect remote team collaboration. The recommended research design is an online questionnaire with approximately 200-300 respondents (Yates method). We start the survey with different qualitative questions about demographic and general information. Subsequently, the survey could collect data for each independent variable in the Likert survey of 1-5 scale. The results shall be analyzed by statistical packages such as SPSS or Stata.

This research aims to make both theoretical and practical implications. In terms of academic contribution, the expected results of the above-mentioned quantitative research will add to the existing literature about team collaboration in virtual settings. Although cooperation in teams is not a new topic in the organizational behavior field, there are not many quantitative results tested in a

remote environment. To the best of our knowledge, several new factors such as e-leadership or collaborative technologies will be empirically tested the first time in the new normal situation. A better understanding of antecedents of virtual team collaboration will broaden our knowledge in virtual team performance, a newly emerged research field. In addition, considering practical implications, a hybrid working style between online and offline will be the future of human work. The ability to co-operate in the collocated team is as essential as a virtual team. Therefore, besides face-to-face workplace, businesses and managers need to understand the factors influencing remote team collaboration to boost team performance in the hybrid working environment. To sum up, because of the importance of virtual work as an inevitable trend for future firm's operations, exploring antecedents that contribute to dispersed team collaboration helps researchers and managers successfully lead a hybrid high-performing team.

4.2 Limitations of the research model

Although the researcher has attempted to categorize various factors related to the effectiveness of remote team collaboration, the research model still has several limitations. With global operations, firms often employ people from all over the world; cross-cultural differences should be considered. Culture and social norms play an important role for teammates to establish mutual trust and shared understanding, affecting team cooperation. The researcher recommends that future academicians might include cultural factors into the research model. Moreover, during the data collection phases, it would be more interesting to collect data from different groups of people from various cultural backgrounds.

Due to the scope of this paper, the conceptual framework only proposes to quantitatively test how various factors affect virtual team collaboration which is one of the components of team performance success. During the social isolation time, many firms and employees reported that they had the same level of productivity as working in the office but a lower level of team innovation. The innovative capabilities depend heavily on the quality of team collaboration. The future researcher can add the virtual team innovation capability into



the research model to further understand how remote collaboration affects innovation ability.

5. Conclusion

When working remotely has become an inevitable trend in the business world, virtual team collaboration is essential for team performance and success. Although traditional management research has mentioned much about collocated team cooperation, the factors affecting virtual team collaboration remain ambiguous for both academicians and practitioners. The paper presents a comprehensive framework of antecedents contributing to remote team collaboration: trust and interpersonal relationships, shared understanding, e-leadership, and collaborative technologies. The conceptual model can be a good reference for future researchers to conduct quantitative research exploring how each factor influences team cooperation success. In addition, the framework helps business managers better understand antecedents of distributed team collaboration, from which gaining know-how to boost the quality of remote teamwork●

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