Virtual Teams

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Abstract

Virtual teamwork has been a growing and steady tendency for several years, becoming an essential structure of current organizations. In this chapter, we define virtual teams, analyze its features and explain its threats, attending to specific Computer-Mediated Communication and organizational theories. Then, based on the Affordances perspective we expose organizational interventions and practices for developing effective and thriving virtual teams.

Key Points

- To provide the reader with a clear understanding of what is and can be understood as a virtual team.
- To show the reader common threats or deficiencies that virtual team members experience, based on classical theoretical frameworks of the area.
- To provide the reader with basic principles for the study of virtual teamwork, organizational analysis, and intervention in the business management field.

Introduction

While virtual teamwork had been on the rise for several decades (e.g. Peiró *et al.*, 1993; Poole *et al.*, 1993), the last 20 years showed a growing and steady popularization of the use of teams interacting virtually. As the reader already knows, the advent of the Covid-19 pandemic propelled it to the forefront and established it as the standard in several companies, especially in the knowledge-based economy and office jobs in general. Succinctly, virtual teams are groups of colleagues who collaborate through technology across time, geographic, and cultural boundaries. Initially, virtual teams were primarily associated with individuals who possessed a high level of technical expertise and were affiliated with organizations that placed a strong emphasis on knowledge-based activities and technological development. These organizations embraced and successfully navigated the obstacles inherent in Computer-Mediated Communication (CMC) to get the most valuable professionals to work together in their teams or specific projects. As we will see, initial tools for CMC were rudimentary and counter-intuitive in their use, navigation and interactivity were faulty and rough, generating skepticism among several organizations and work teams. Despite this, globalization led to high competitiveness between organizations and the emergence of increasingly sophisticated Information and Communication Technologies (ICT) caused this initial growing tendency of virtual teams in the last 20 years. The covid-19 pandemic, which led to massive population restrictions, in many cases forced the use of virtual teams and CMC (Chai and Park, 2022), and was a test of their ability to meet the requirements of the market. This tendency has been observed in higher education and industry, where virtual teams and remote work in general became essential for collaborative learning and task completion (Costin, 2022). Nowadays, it has been observed that a significant proportion, reaching up to 60% of the workforce, continues to engage in various types of virtual work arrangements. Furthermore, these individuals perceive virtual teamwork to be an optimal method of collaboration, even though they are also well aware of the associated threats such as obstacles to creativity or effective close collaboration and reduced social links (RW3 CultureWizard, 2022). Despite this, the benefits of virtual teamwork surpass the constraints. In consequence, organizations have been adopting virtual teams as a primary way to structure work, but there is still a need for theory and scientific research to inform the design and management of virtual teams in their different forms.

This chapter aims to provide a broad picture of the topic of virtual teams, its challenges and potential strategies, that, based on the affordances perspective (Gibson, 1978), promote virtual teamwork development. In the following sections, I will first define

virtual teams and contrast them with related concepts. Then, I will expose key challenges that virtual teams face. Finally, I will briefly expose variables to consider in the study and design of effective virtual teams that can thrive in a complex and competitive environment.

Virtual Teams: A Complex Conceptualization

Virtual teams are defined as groups of two or more persons, who are geographically and/or temporally dispersed and collaborate due to the existence of common goals by means of electronic (virtual) media. More specifically, these team members show interdepencies concerning tasks, workflow and/or outcomes; and communicate, coordinate and are brought together mainly through electronic communication technologies (ICT) (DeSanctis and Monge, 1999; Hertel *et al.*, 2005; Jarvenpaa and Leidner, 1998; Mathieu *et al.*, 2019). This comprehensive definition aims to attend classical and more recent authors defining virtual teams, whose understanding of the concept tends to coalesce in a set of specific conditions or variables.

First, virtual teams are groups, yet, being rigorous, not all virtual groups can be labeled as teams. This can trigger misunderstandings as virtual teams and virtual groups have similarities, and is common to use the terms interchangeably, especially in face-to-face groups and work contexts (Peñalver *et al.*, 2020). Both involve collaboration through virtual media of dispersed group members. They are both forms of remote work or interaction that have seen increased adoption due to factors such as globalization, digitalization, and the COVID-19 pandemic (Nemiro, 2023; Urien, 2023). However, there are also differences between virtual teams and virtual groups. Virtual teams are typically focused on performing targeted, complex, and creative tasks in organizations and business contexts. Virtual team members usually have specialized roles and know each other identities and roles. On the other hand, virtual groups can refer to any group that collaborates virtually, regardless of the nature of their tasks. For example, members of a virtual community of practice may be considered a virtual group, whose members may or may not know each other, and have a shared interest or global goal -solving questions, learning together-, yet this loosely connected group of an online community won't be considered a virtual team, as the membership is highly permeable, there are no differentiated and preestablished roles, and their purpose is not working together towards specific objectives. Moreover, virtual groups of workers may be considered colleagues who virtually interact together yet they do not constitute a team, with work arrangements such as remote working or telecommuting (Nemiro, 2023). This goes hand in hand with the different labels sometimes used in the literature, such as distributed/remote teams, online teams, telework groups and other labels that usually refer to the concept of virtual teamwork (with specific nuances, such as the degree of dispersion or the virtuality of the team).

Second, virtual team members show interdependencies concerning tasks, workflow and/or outcomes. This tight link of the members of a virtual team is a well-established characteristic in the characterization of co-located teams. This similarity is attributable to the fact that virtual teams are primarily constituted as teams (Gilson *et al.*, 2021). In recent years, due to the prevalence of virtual teamwork, the concept of virtuality has become more a characteristic of the team than a definitory trait (e.g. Mathieu *et al.*, 2019). In brief, a growing body of scholars suggests that most teams can be described on a continuum of virtuality, with the degree of virtuality determined by factors such as spatial distance, tasks, objectives and ICT (Gilson *et al.*, 2021; Mak and Kozlowski, 2019).

Finally, and related to the degree of team virtuality (Gibson and Gibbs, 2006), the geographical, temporal and sometimes cultural dispersion is a condition that commonly has conceptualized virtual teams -in comparison to face-to-face or co-located teams-. The prevalent reference was that a company would be able to have workers across different time zones (i.e. "around the clock") working on a project. Consequently, virtual teams were a key organizational design structure that would skyrocket the ROI and performance of team members. Because of this, typically, members of virtual teams will be from different countries and cultures, highlighting both the cultural and geographical distance among team members. Despite this, the assumption was barely supported by professional practice, as technological and human-interaction limitations were very present in early virtual teams (Gilson *et al.*, 2021; Nemiro, 2023). As technology evolved, more companies started to implement virtual work tools and practices. Surprisingly, not only fully dispersed individuals were eager to become virtual workers, but also partially co-located colleagues who used virtual teamwork tools to organize their day-to-day workflow. Nowadays, shared documents -such as calendars, and synchronic shared work documents-, virtual meetings, and, overall, virtual teamwork is the norm in the knowledge-based economy.

In sum, there are advantages and disadvantages associated with the utilization of virtual teams, producing tensions and paradoxes of virtual teamwork (Gibbs and Navick, 2023). Therefore, a broad perspective is required to understand and study its challenges and opportunities. In consequence, I first adopt the classical "deficiency" model, in which I review the potential challenges that virtual teams may face. This classical perspective usually considered technology as either neutral or negative to teamwork (Gilson *et al.*, 2015). Per contra, the affordances perspective deepens into how the possibilities of CMC and teamwork can be boosted, embracing complexity and encompassing not only the drawbacks but also the enhancements of the assets (Duan *et al.*, 2023; Gibbs and Navick, 2023; Mathieu *et al.*, 2019).

Virtual Teams: Understanding Challenges Through the Lens of Theory

Common challenges of work teams have been profusely discussed in the scientific literature (e.g. Alcover *et al.*, 2021) and are well-known among practitioners. However, it has been already noted that more and more work teams are virtual in nature to varying

degrees (Mathieu *et al.*, 2019). Despite this, the way these virtual teams work may not be perceived as equivalent to the face-to-face context (Gilson *et al.*, 2021). The creation and management of effective virtual teams involves a particular set of challenges inherent to the team and derived from their use (Chai and Park, 2022; Dulebohn and Hoch, 2017; Feitosa and Salas, 2021; Morrison-Smith and Ruiz, 2020; Nemiro, 2023).

As we all have experienced when working in virtual teams, the first challenge we face is managing the technical and structural limitations associated with the virtualization of teamwork itself (Curşeu *et al.*, 2008; Morrison-Smith and Ruiz, 2020). Attending to the cues-filtered-out theories (Culnan and Markus, 1987), CMC causes the loss of nuances implicit in face-to-face communication, and nonverbal and contextual cues, which negatively affects the social and communicative role they play. The lack of communicative resources in virtual environments often results in less effective information transmission and deficits in team communication. These technical limitations can impact task coordination, generate role ambivalence, saturation of group members, cognitive overload, and lead to misunderstandings among members (Hertel *et al.*, 2005; Nurmi, 2011). For example, difficulty in conveying facial expressions or tone of voice in a video call in a place with poor coverage may result in less clear communication that is prone to confusion.

Technical and structural limitations were a common topic in early CMC studies related to virtual teams interacting via, what was known as group work support systems (Peiró *et al.*, 1993). These initial virtual teams were limited by bandwidth, interactivity of the ICT, and stability of the system. The tools were unreliable, counterintuitive and rough. Working in virtual teams was a synonym of technical problems and difficulties. Nowadays, technology is more stable, powerful, and interactive and the design is intuitive (user interface and experience are a keystone of software and web design). Consequently, it has been argued that the cues-filtered-out perspective is, to some extent, outdated as the technology already enables a broad and multi-sensorial user experience. In addition, it has been considered that advancements in hardware and technological bandwidth have also posed a challenge to the dominant position of textual content on the internet (Carr, 2020). However, technical, and structural limitations continue to pose challenges (Morrison-Smith and Ruiz, 2020) to virtual teamwork, with recent phenomena such as the "Zoom Fatigue" present. Additionally, text-based CMC is still prevalent as a medium in virtual work (Placiński, 2022) -Consider, for instance, the abundant quantity of email, asynchronous messages and collaborative documents that you manage in your daily work-. Moreover, is important to consider that in non-WEIRD (Western, Educated, Industrialized, Rich, and Democratic) contexts, the most basic technological limitations continue to be a threat of first magnitude (e.g. internet going down due to electric power shortages).

In addition, the use of ICT for virtual teamwork (e.g., Microsoft Teams, Zoom) requires specific competences and expertise for their use. The absence of these skills could lead to increased requirements and job demands (Demerouti, 2020). That is, the technical skill level of users may require additional effort in performing their tasks within the assigned role. Considering the Job Demands-Resources Theory (Demerouti *et al.*, 2001), all organizational characteristics may represent job demands or resources. A job demand implies an aspect that requires effort and has an associated psychological cost, which may result in a deterioration of health -for example, free-riding or low performance of the team due to the burnout of their members-. On the other hand, increased job resources -competences in this case- enhance engagement and positive outcomes through the motivational process (Bakker and Demerouti, 2017). Considering this, a lack of knowledge, skills and positive attitudes over tools, together with the potential technological failures, and inadequate design and management of ICT can mean increased job demands and a lack of resources for members of virtual teams.

Third, based on prior theory and research, another challenge that needs to be addressed when working in collaborative virtual environments has to do with in general terms with the distance of team members (Jimenez *et al.*, 2017; Morrison-Smith and Ruiz, 2020; Nurmi, 2011). In the context of global virtual teams, Jimenez *et al.* (2017) point out that the popularization of virtual teams requires a frame of reference to understand their complex nature. Then, inspired by the principles of the network society (Castells, 2011), they suggest three dimensions that influence the effectiveness of virtual teams: location, time, and distance. They argue that virtual teams vary along these three dimensions, which are interrelated and create a three-dimensional analysis. For example, distance ranges from co-located team members to "expatriate" team members, also varying over time. This distance is understood not only in geographical terms but also encompasses the cognitive distance that can occur between members, especially marked in the case of virtual teams by social and cultural elements. For example, the diversity of the team can lead to the emergence of subgroups (Lau and Murnighan, 2005). This can be due to the perceived differences in identity, knowledge and resources that will lead to inter-subgroup conflict, competition, reduced collaboration and decreased team effectiveness (Carton and Cummings, 2012). In brief, distance in its different forms will influence processes and collective behavior, impacting the achievement of its results and other key performance indicators (Carton and Cummings, 2012; Jimenez *et al.*, 2017).

Following this line, research reveals that many users of virtual teams experience feelings of loneliness and potential isolation from their peers (Morrison-Smith and Ruiz, 2020), based on the cognitive and affective perception of the lack of presence of other members (Blanchard, 2021; O'Leary *et al.*, 2014). Moreover, they may experience relevant information deficits versus face-to-face teams (González-Anta *et al.*, 2020). Additionally, the physical distance between members and the lack of informal in-person interactions, such as getting to know each other personally, contribute to a greater sense of isolation among them (Johnson *et al.*, 2009). As a result, in virtual teams, more social loafing or "free-riding" (one team member contributes less to shared goals (Monzani *et al.*, 2014)) may occur due to limitations in the richness of the medium and intricacies of virtual teamwork, ultimately harming team sustainability by influencing team satisfaction or cohesion (Peñarroja *et al.*, 2017). In short, when working in virtual teams, the responsibility of each member for the results may be blurred. Feelings of isolation, lack of monitoring and accountability, and suspicions about the other members may arise.

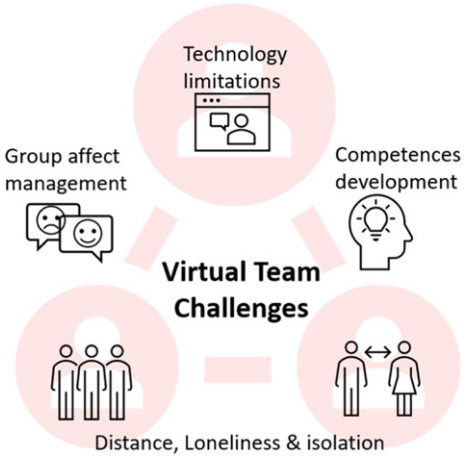

Fig. 1 Virtual team challenges explained in the section.

Finally, and partly derived from the previous challenges, teamwork through technology has an impact on the development of group affect or affective climate (Kelly and Barsade, 2001). In teams, affect is an essential part of group dynamics (Bell *et al.*, 2018; Gamero and González-Romá, 2020). The emergence of this collective dynamic originates from the combination of the individual emotional experiences of the members and the emotional environment in which they develop (Barsade and Gibson, 1998). It will be, therefore, an affective experience shared or maintained by the members of the group (Barsade and Knight, 2015). The presence of an adequate emotional environment in the group plays a fundamental role in the results of both the team and its members, influencing various aspects such as decision-making processes or satisfaction among others (Barsade and Knight, 2015; Druskat and Wolff, 2001; Gamero and González-Romá, 2020). This group's affect in virtual environments can be impaired due to the constraints of technology and the resulting interaction (Cheshin *et al.*, 2011; Druskat and Wolff, 2001; Gamero and González-Romá, 2020; Johnson *et al.*, 2009). For example, according to research by Johnson *et al.* (2009), it has been highlighted that in virtual teams, when virtuality is high, a reduction in the levels of positive affect and engagement is experienced (Johnson *et al.*, 2009). Following this same line, Cheshin *et al.* (2011) have observed that virtual teams present an increase in the levels of negative affect, especially when simpler means such as written communication are used (Cheshin *et al.*, 2011).

In brief, as shown in **Fig. 1**, virtual teams can face technical and structural limitations of CMC tools that can hamper fluent, visible, and seamless interaction. Moreover, physical, cognitive, social, and cultural distance between members may trigger feelings of isolation, loneliness and derived issues. Virtual team members also experience a constrained development of group affect due to fewer emotional cues and other technological features, resulting in potential group conflicts, lower performance and wellbeing. Professionals and researchers need to analyze and tackle these issues through interventions and organizational policies and practices that aid in creating thriving virtual teams.

Thriving Virtual Teams: Suggestions for Research and Development

The notion of thriving (sometimes called sustainable) virtual teams encompasses the understanding and examination of the various factors that contribute to the successful functioning, development and results of teams that operate in a virtual setting, thereby requiring a deep understanding of the unique challenges and opportunities that arise in such contexts. In this vein, the affordances perspective (Gibson, 1978) is an approach used in organizational development to understand how individuals perceive and utilize technology in their work. It is based on the concept of affordances, which refers to the action possibilities that technology offers to team members. The affordances perspective recognizes that technology can have both enabling and constraining effects on CMC and work practices (Duan *et al.*, 2023). It emphasizes the importance of considering how users perceive and interact with technology, as well as the social and contextual factors that shape their actions (Gibbs and Navick, 2023). This perspective also recognizes the active role team members may have in co-creating shared meaning and understandings of the virtual work. Thus, it has been applied to the study of virtual work, including virtual teams, to uncover the distinct possibilities for promoting actions in technology-reliant work settings.

First, attending to the technology and structural limitations, one of the key features that virtual teams need to analyze and consider is the ability of a communication medium to transmit multiple verbal and nonverbal cue systems simultaneously (Walther, 2011). This "richness of the medium" (Daft and Lengel, 1986) will be essential to team flourishing, but can negatively affect team development if it's not adequate. Thus, it is important to work on both the social and technical components to solve these limitations. First, it will be important to provide the teams with tools that are reliable and allow an optimal richness of the environment, adapted to the needs and goals of the team and the characteristics of the members. For example, a prerequisite will be enough internet bandwidth, hardware capability and basic systems. This seems obvious, but in non-WEIRD contexts, with

businesses working on a budget, is a prerequisite that needs to be checked. Then, human-computer management will be considered, attending to factors such as spatial layout, UX/UI design, functionality, and ambient conditions (Houtkamp, 2012). As proposed by the Theory of Media Synchronicity (Dennis *et al.*, 2008), we will choose ICT that fits the needs, objectives or tasks of the team, keeping it simple for simple activities, and using richer media for team development or complex tasks (Gilson *et al.*, 2021). For example, a team manager will propose to use a WhatsApp group for easy and fast communication if the sole purpose of the team can be addressed through short messages that must be read anywhere. Per contra, a complex task, with several documents, team appointments and intensive collaboration will need a more sophisticated tool or medium (e.g., Microsoft Teams). In this situation, virtual teams will require tools that allow devices and system integration (i.e., that can integrate seamlessly with each other to minimize data silos and enhance workflow), various forms of collaboration, multiple communication channels and group digital monitoring and accountability.

Once the technology is reliable, seamless, and user-friendly (in brief, can be labeled as "optimal"), is important to address the potential lack of competences or expertise. First, it will be necessary to provide the members of virtual teams with technical tools that, given our aims, have a fast learning curve (the speed at which a team member can gain competence in a particular technology). Then it will be necessary to conduct a training needs analysis and develop a training plan for team members and managers. Virtual teams will thrive if their members receive training that allows them to improve their knowledge, skills and abilities, rebalancing the resources-job demands tandem, enhancing the team members' command over technology, transforming them into instruments rather than ends in themselves (Demerouti, 2020; Gilson *et al.*, 2021).

After the hard facets of virtual teamwork -technology and competence- are covered, it is important to attend to the group climate and its members. First, for the perceived distance, loneliness and isolation, several actions can be taken. To begin, it must be noted that virtual presence and interaction require, in general, a proactive approach of team members. For example, when you are in a face-to-face meeting, you can look at the eyes of the speaker, nod and easily participate in nuanced manners. Per contra, when we try to foster closeness and avoid isolation in virtual teams, a more active role will be required. Common organizational interventions for loneliness focus on improving communication and actively promoting virtual presence, especially in fully virtual teams, for example through informal social meetings using technological means. One organizational practice will be to create virtual spaces for interaction (Feitosa and Salas, 2021). It has also been suggested to have team members establish their online presence through status updates, profile photos of themselves and descriptions of their profiles (self-disclosures) so that colleagues can make a mental composition of that person (Batenburg and Bartels, 2017; Chiu and Staples, 2013). Finally, the isolation that can also trigger free-riding can be tacked by means of proper teamwork assessment, leadership and promotion of trust and mutual accountability. For example, feedback should be provided on a regular and systematic basis. Especially for reducing social loafing, team leaders need to provide clear instructions, and establish communication practices that help to engage members and mutually follow their progress (e.g., the team should respond to emails within a working day). These leaders should also monitor workflow and associated communication through the different digital monitoring features. Peer review and debriefing sessions should also be considered (Feitosa and Salas, 2021; Gilson *et al.*, 2021).

Finally, it is of utmost importance to cultivate a proper affective environment to fully harness the potential of virtual teams. Faced with this challenge, recent research posits brief training in digitized emotional management competences as a method for conflict reduction, improved well-being and performance (Gamero *et al.*, 2021; González-Anta *et al.*, 2020). Indeed, group interventions constitute a research-supported strategy to address several challenges and tackle the obstacles inherent in team management in general (Salas *et al.*, 2018). For example, Hughes *et al.* (2016) showed that team coaching in healthcare improved competences and performance, regardless of the strategy followed, group composition, or contextual factors. In virtual teams, Martínez-Moreno and collaborators (2015) observed how intervention through team feedback and reflection could benefit group conflict management (Martínez-Moreno *et al.*, 2015). Similarly, Peñarroja *et al.* (2017) also highlight the usefulness of training in virtual teams to improve satisfaction and reduce social loafing (Peñarroja *et al.*, 2017). Moreover, as the group affective climate is closely related to the previous challenges and potential affordances proposed, previous interventions and organizational practices may also help to indirectly improve group affect.

Conclusion

This chapter aimed to provide a broad vision of the topic of virtual teams, its inherent and derived threats, and potential developments. We have first provided a definition of the construct, delving into its main features, parallel constructs, and specificities. Then, based on a classical approach to the analysis of the virtual teamwork phenomenon, we examined common deficiencies, guided by different theoretical approaches (Media Richness Theory, Job Demands-Resources Model; and Group Affect Theories). The analysis highlighted six virtual teamwork challenges: Technological limitations, competence development, distance, loneliness and isolation and group affect management. Then, we acquire an affordances model perspective, intending to maximize the capabilities of virtual teams. To do so, we explain specific actionable interventions, policies and practices for its inclusion and development in organizations. We propose initially tackling the challenging technological and competency aspects of virtual teamwork through the provision of adapted ICT and targeted training. Afterwards, we recommend focusing on the quality of the perceived interactions and related factors, such as the distance, the isolation and the potential free-riding. Finally, we advocate for developing an excellent group affective climate to foster thriving, sustainable and successful virtual teams.

The exploration of virtual teams in this chapter also intended to shed light on the dynamic and evolving landscape of contemporary organizational structures. As we navigate the intricacies of virtual teamwork, it becomes evident that the concept is not merely a trend but a transformative force in the way we collaborate and conduct business. Virtual teamwork in its various configurations will continue to be embraced and promoted in organizations, probably soon not only with the support of ICT but also assisted by different Artificial Intelligence tools that will create new and complex understandings of what virtual teamwork can mean. In that new scenario, the impact of virtual teamwork will probably continue to extend beyond the individual wellbeing of team members and its effectiveness, to encompass the overall return on investment of the organization on a global scale. Researchers and practitioners will be faced with new challenges, questions, and opportunities on how to study and manage virtual teams.

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