

# The Future Workplace: Characterizing the Spectrum of Hybrid Work Arrangements for Software Teams

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***Abstract – The better-than-expected forced working from home (WFH) experiences coupled with investments enabling remote work during the pandemic motivated many employees to continue WFH occasionally, often, or entirely. Many organizations adjust their policies to increase flexibility as reported in numerous news outlets, articles, blogs, and channels dedicated to future workplace. The studies praise the flexibility given to individuals and the increase in the work-life balance but also warn about the alienation of staff members, decreased team cohesion and sense of belonging, as well as dilution of the corporate culture. This article systemizes a spectrum of emerging work arrangements for teams, including hybrid teams, partially aligned teams and, more importantly, variegated teams with fully aligned alternation of office presence. Our team typology is based on the practical insights from ‘Alpha,’ ‘InterSoft,’ Valtech, IBM, Brandwatch, and Ericsson and provides a nuanced vocabulary for organizations to start reasoning about the future work arrangements.***

During the COVID-19 pandemic, we learned that many preconceptions about remote work were misplaced, and developers adapted to the emerging situation reasonably quickly [1, 14], with their daily work lives not particularly disrupted [2]. Such better-than-expected forced working from home (WFH) experiences, coupled with the investments enabling remote work during the pandemic, led many knowledge workers to rethink their return to the offices [3]. The interest in working remotely from home or in an alternative working space like a café has become mainstream. Employees started to express their wish to keep the job as they move to remote cities or even globally and leave if they are not permitted to work remotely [3, 4]. In response to the new demands, many companies alter their work policies and experiment with new work arrangements that balance expectations from employees and management regarding where and when the work should be done [4].

The word “hybrid” has become one popular umbrella label attributed to various work-related terms. These days, we often read about hybrid

workplaces or hybrid offices [5], hybrid work or working [6, 7], as well as hybrid teams [8]. Google Workspace experts define *hybrid work* as “a spectrum of flexible work arrangements in which an employee’s work location and/or hours are not strictly standardized” [6]. In other words, anything that lies in the middle of “in the office, nine till five” and “anywhere around the world at any time” [6]. However, one should be careful in using the word *hybrid* to describe individual choices or team arrangements. If someone is free to decide when and where to work, it does not mean that the chosen work arrangement will be hybrid. Studies show that, despite the introduction of hybrid work policies, at least some employees in every company prefer to return to the office full-time [4]. So, what does “hybrid” mean for individual work arrangements, and especially for teams?

An early occurrence of the word *hybrid* with corporate work appeared long before the pandemic. *Hybrid workspaces* emerged from the interest in homeworking motivated by increased commuting distances and time, as well as virtual working motivated by the pressures on office

costs and space, growth in the use of hotdesking, and contemporary architectural trends [9]; somewhat similar reasons to those driving employees towards continuing WFH today [10]. Halford suggests defining the “multiply located” workspaces as hybrid workspaces. *Hybrid work* is also used to refer to distributed teams consisting of co-located and remote members in the context of global software development and outsourcing [7].

Even today, the use of “hybrid” work arrangements varies. For example, Fayard et al. attribute *hybrid* to the office and define *working in the hybrid office* as the practice of “moving between a home workspace and a traditional office building” [5]. In contrast, Google Workspace experts define hybrid work in relation to restrictions imposed on the work location and/or hours [6]. The latter adds the time perspective to Halford’s proposal [10], echoed by a few others [11, 12]. The list of definitions of *hybrids* are contradictory and could continue.

Interested in achieving clarity in understanding the future work arrangements, we deconstructed the terminology related to the future workplace, and set the boundaries of hybrid work in the context of remote work [17] and “telework” [18], which have been researched in decades.

In 1983, Olson defined remote work as “*organizational work performed outside of the normal organizational confines of space and time*” and focused on satellite and neighborhood work centers, flexible work arrangements and work-at-home as remote work options [17]. In addition, Sullivan points out that the use of technologies, proportion of work time that is decentralized, and contractual arrangements (employed or self-employed) are important distinguishing dimensions [18]. In the context of software companies, the use of technology goes without saying and we focus on contracted employees. Thus, we argue that the core dimensions relevant for understanding individual work arrangements in the future workplace are *location* (where the work is performed) that incorporates the degree of remote work, and *work schedule* (when the work is performed). To avoid

confusion, we suggest using the following location options:

- office mode,
- office-first – primarily in the office,
- office-remote mix (flexible, “working from anywhere”),
- remote-first – mostly offsite, and
- remote mode.

We intentionally use *office-first* and *remote-first* options instead of *hybrid* because a location cannot be simultaneously of two types. We, thus, suggest avoiding terms such as *hybrid office* and *hybrid workplace*. We use the word *remote* for any location other than the office. Other often used terms include WFH, work-from-anywhere (WFX or WFA), telecommuting, teleworking, homework, home office, mobile work, outwork, and the flexible workplace [12].

But what happens on the team level when individual work arrangements differ or do not match? In this article, we add another important dimension that distinguishes flexible work arrangements in the team context – the degree of alignment of the individual arrangements among the team members, presented in the text section.

## Emerging Work Arrangements

In this article, we present team typology and multi-dimensional work arrangements (see Figure 1) emerging through the iterative process of inductive reasoning and derived from the above-mentioned existing research and the six industrial cases presented later. Our goal is to offer a vocabulary to avoid the confusion that seems to prevail in the current conversations about hybrid work arrangements. Ironically, similar confusion regarding the boundaries of the phenomenon prevails in telework research [18].

The most traditional work arrangement until now has been “in the office, nine till five”; thus, onsite teams with aligned work schedules have prevailed. We are also familiar with the well-researched concept of virtual or remote teams, as often temporary formed expert teams with geographically dispersed members. Similarly, distributed teams have been commonplace in

global and outsourcing projects as permanent multi-location teams with members working from different geographically distant offices of the same or different cooperating companies [8].

When individual work arrangements in the team differ, a spectrum of new work

arrangements emerges along with the degree of alignment among the team members (see the Y axis in Figures 1).

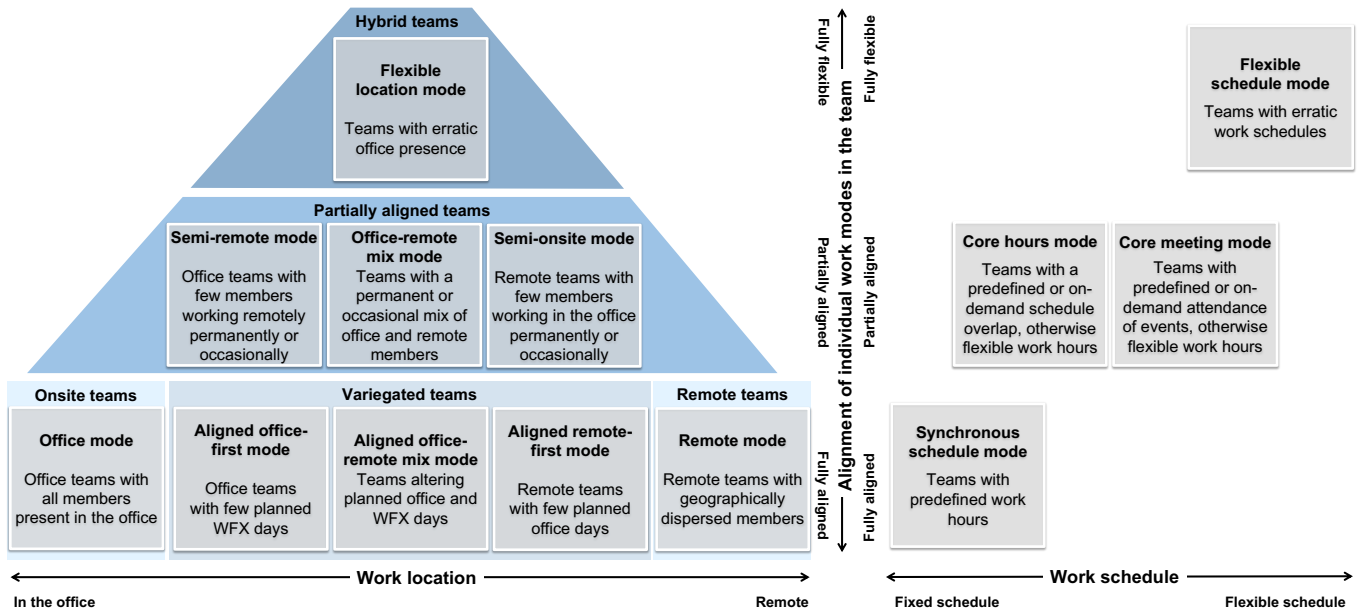


Figure 1: Team typology and the spectrum of work arrangements

**Hybrid teams**

Hybrid teams are related to distributed teams, but instead of office locations, their members could WFH, a café, or anywhere else. These are Halford’s teams consisting of “multiply-located” members working in the office and from home [9] and more recent hybrid teams described by Santos and Ralph as teams in which, on any given day, some team members may be working in a co-located office while others are working remotely [8]. We suggest distinguishing further between the degree of alignment of individual work arrangements in a team. Hybrid teams are never completely virtual, yet different hybrid teams can occupy different ranges of the virtuality spectrum [16]. We thus define hybrid teams with a fully flexible location mode having erratic office presence and additionally define partially aligned (or partially hybrid) teams.

**Partially aligned teams**

Partial alignment in teams can surface when not everybody’s arrangements are aligned, or when

members do not always align. For simplicity, we define three archetypical modes with members having an agreed intention to be working in a semi-remote, office-remote mix or semi-onsite mode. In practice, these are clusters of team arrangements that span the spectrum between the fully flexible and aligned location modes.

**Variegated teams**

Notably, flexible work policies do not always lead to erratic choices. Teams with aligned location decisions we call *variegated teams*. These teams have predefined but altering work locations with varying degrees of office presence. In other words, these are teams that change or variegate their team’s work arrangement between the office and remote locations. Because of these changing experiences, we chose to use the term variegation, which comes from botany. Variegated teams can have few aligned WFX days, which we call *office-first mode*, teams with a few aligned office days or on-demand occasions, which we associate with the *remote-*

*first mode*, and teams with a fair mix of office and WFX days, which we associate with the *office-remote mix mode* because the variegation between the remote and office mode in these teams is fairly balanced. The main difference between hybrid teams and variegated teams is that the latter teams, on any given day, have a level-playing field experience with either all team members working in co-location onsite or all members working remotely.

Besides the location, a work arrangement also includes an agreement about the work schedule. These may differ based on personal preferences or different time zones. Teams may have the following options:

- *synchronous mode* with fully overlapping work hours, e.g., 9 AM – 5 PM;
- *flexible mode* with potentially erratic work schedules;
- partially aligned work schedules:
  - 1) *core hours mode* with designed time overlaps, in which members choose a synchronization window and have otherwise flexible schedules; and
  - 2) *core meeting mode* organized around scheduled meetings or designed events, which members agree to attend planned meetings, gatherings, and events, but otherwise keeping work schedules flexible.

## Choice of Work Arrangements

The choices of work arrangements can be influenced by various factors: management expectations, employee preferences, teammate agreements, nature of the work assignments and job roles, organizational policies, corporate culture [4], and commute distances considering the growing environmental concerns (see Digital Nomads [13]). Companies enforce policies best suited for their corporate culture and traditionally had centralized regulations with one dominant work arrangement option as the common rule (e.g., synchronous office mode). Today, companies often choose to delegate work

arrangement decisions to immediate managers or teams or leave the choice to every employee, allowing a fully flexible policy [4].

Besides, work arrangements can change overnight in response to a societal emergency, such as government-enforced policies. The pandemic crisis has also demonstrated that companies with flexibility incorporated in their operation have successfully transitioned to the enforced full-time work from home [14], linking organizational policy flexibility with increased organizational resilience to crisis.

## Practical Insights

Following, we provide a selection of empirical insights showcasing the defined work arrangements and their evolution since the beginning of the pandemic. These are based on six semi-structured interviews with team managers and team leads from six different companies ('Alpha', 'InterSoft', Valtech, IBM, Brandwatch, and Ericsson).

### Alpha (pseudonym)

At Alpha, we met a team that, at the time of our study, was neither subject to corporate-level policies nor imposed a team-level agreement on where and when team members shall work, i.e., a *hybrid team* with erratic office presence and a *fully flexible schedule*. As one of the members explained: "[...] Now it's like you work at random times sometimes. You get more and more loose. You don't start at 9:30; you might start late, you might finish late."

We learned that this arrangement was not ideal because it made scheduling problematic as the work schedules of team members were unpredictable. To address this issue, the team considered aligning the work schedules to achieve a certain overlap. As the tech lead explains: "So we [the leadership team] were talking about identifying [...] a core time slot for the team. Like everybody has to be available from, I don't know, 10:30 to 3:00. Then the rest you'll handle how you like." In other words, the

team saw the need to partially align their schedules as the *core hours mode*.

### **InterSoft (pseudonym)**

The studied team from InterSoft valued the ability to rely on the availability of team members during the workday. They worked “roughly 9-17”, as the manager said, and started the day with a synch meeting at 9:30 in the morning. In other words, the team established a *synchronous schedule mode*. At the same time, as a distributed-first company, InterSoft employees can freely choose whether they want to work predominantly in the office or predominantly from elsewhere (home or a co-working space). Employees are even allowed to move to another country with the manager's permission. The corporate program supporting remote work is called “Work from Anywhere”. In the studied team, members were distributed between Sweden (5 members), the Netherlands (4 members), the UK (2 members), and Spain (1 member). Even members from the same country did not align their office presence, making it an example of a *hybrid team*. The manager revealed that their work arrangement worked well for them, but likely due to the *synchronous mode*. When confronted with the ability to employ a new member from the USA, the manager had to reject the application since such a change would violate the ability to have aligned work schedules.

### **Valtech**

The practitioner we met at Valtech worked with seven teams, most of which worked in a traditional *office mode*. The two remaining teams were distributed with subgroups working in different geographically distributed offices or WFX. All teams had *synchronous schedule mode*: “[During] a normal working day before the pandemic, everyone would more or less be working at the same hours.” Back then, flexibility was limited to special occasions on an individual basis (e.g., doctor's appointments).

Throughout the forced work from home periods caused by the COVID-19 waves, the teams adjusted rapidly to *remote mode* with no clear policies regarding the work schedules.

However, it was soon agreed that the time flexibility had to be “in accordance to what the team needs” and agreed on following a *core meetings mode* targeting morning synch meetings. As they highlighted: “If the team has agreed on specific meeting times for shared meetings, you cannot plan your work so that you cannot attend those. But there might be people attending daily standups in the morning, and then basically wait with working until the afternoon”.

After COVID restrictions were lifted, most teams returned to the *office mode* as Valtech values co-location. However, the company also permits WFX in response to the employees' wishes. Therefore, Valtech promotes alignment on the *core meetings* so that employees and members of teams can more often WFX, while ensuring minimal disruption to teamwork dynamics.

### **IBM**

Pre-pandemic, our contact at IBM worked with multiple teams of developers dispersed across offices in India and Denmark. Meeting occasions were fixed for these teams, with the remaining hours being fully flexible (*core meeting mode*): “[...] if we had planned meetings then we would facilitate how that should actually go, and if we will work physical together, we would then kind of say – Guys, we meet, and we create those expectations [...] so that's how the meetings went, but the working hours [...], that has always been flexible.” However, despite working from their offices, most meetings were carried out online: “[...] what we did a lot of the times was, even though we were co-located, we made sure to have noise canceling headsets, and we were sitting together on our own laptop, with our own screen, our own microphone headset, and being virtually together all of us. So, we would all have this barrier [level-playing field].” After the reopening of the offices, our informant switched to a single team dispersed between Denmark, Sweden, Finland, Austria, and Norway. All team members apart from the informant work remotely. In contrast, the informant works primarily from home, with two ad hoc days at the office per the current company policies. Given this flexibility

and the time differences between the teams, their work arrangement provides an example of a *hybrid team* and schedule aligned for the *core meetings*.

### **Brandwatch**

Before the pandemic, one of the teams at Brandwatch worked in a *partially aligned mode*, with majority of members working from their office in Copenhagen and one located in Bulgaria. This team also adjusted quickly to *remote mode* during the pandemic, and, given that the company has yet to establish any policies that would require employees to return to the office, the team has maintained their work arrangement in a *remote mode*: *“So nobody cares where people have been working from since forever. But, if before maybe there was a sentiment from employees that [the arrangement] was an exception, now maybe the sentiment is that it's not the rule, but it's just the normal thing.”*

### **Ericsson**

The manager we met at Ericsson discussed his experiences from cooperating with other managers in the leadership team. Before the pandemic, all managers were fully present onsite and worked in an *office mode*, which has, similarly to all other cases, changed with the pandemic waves that forced everyone to work from home in a *remote mode*. After the reopening of the offices, Ericsson decided to make its policies more flexible and allow employees to work from home 50% of the time within a calendar year. In other words, they are not restricting office presence to mandatory office days. As a result, while many managers in the leadership team have returned to regular office work, some alter office days with remote days of WFH, with one manager residing most of the time at home and commuting one day a week to the office. Overall, the team can be described as *partially aligned with semi-remote mode* (one or several remote satellite workers). On the question of whether this setup is working well, the manager explains – *“It works, but after spending three days onsite working closely together during the onsite*

*workshops we had last week, it became clear that work in the same environment feels better.”* Further, he clarifies, *“I would prefer to have everyone on site to just be able to go and ask a question. Even though we [the leadership team] do not sit in one room, office presence makes such spontaneous discussions easier”.*

## **Conclusion**

**Work-life balance in the spotlight.** We live in a period of transition, where well-being and work-life balance are perceived as more important than material incentives. Several studies and our own investigation have demonstrated that for some, well-being and work-life balance are associated with working predominantly in the office or a co-working space, for some with primarily WFH or the favorite café, and others with a mix of work locations [1-4, 10, 12, 14]. The importance of well-being and work-life balance will likely lead to an overall rethinking of the role of work in our societies, which is evident in the changes already implemented in corporate work policies [4]. Yet, a better understanding of the benefits, limitations and required support for WFH in different groups is needed (e.g., women, caregivers, parents with small children), before choosing a one-fits-all plan.

**New work arrangements have emerged from an increase in remote work.** In this article, we contribute to the debate of what to expect in the future workplace and the destiny of teamwork considering flexible work arrangements. We define *hybrid teams* with members altering their office days and WFX days in an erratic manner, followed by a spectrum of partially aligned options, in which not all team members and/or not always have the level playing field work experiences. In the past, these work arrangements have been tightly associated with a negative impact on team performance, one of the main reasons why managers and co-workers have been opposed to the implementation of remote working [12]. Partially dispersed teams in the global and distributed software engineering research are infamous for division into subgroups

and accompanying “us vs. them” attitude, reduced team cohesion, increased coordination difficulties, alienation of remoters, and a significantly weaker sense of belonging [15]. The first studies of hybrid and remote-first teams emerging during the forced WFH also bring forward the first reports of coordination problems [8], echoing the pre-pandemic findings.

**Variiegated arrangements work best for team-centered forms of collaboration.** Like Santos and Ralph, we, too, worry about returning to the pre-agile processes [8]. However, given the positive experiences with fully remote working from home during the pandemic that ensured the level playing field experience for everyone, it is evident that teams that alter work in the office and WFX do not need to be hybrid or partially aligned. In our work, we have identified and focused the attention on *variiegated teams*, which in contrast to hybrid and partially aligned teams, move between the office and the remote modes in an aligned fashion, thus keeping the level playing field experience and avoiding the challenges associated with the hybrid work mode. Our practical insights into the life of hybrid teams indicate that alignment is necessary and sought after, if not complete alignment (in the office, nine till five), then at least having an inevitable overlap in work schedules (core hours or core meetings). At the same time, our findings suggest that working from anywhere, anytime, and hiring people from anywhere might not be the best option unless companies allow team formation that maximizes the alignment among the team members by self-selecting like-minded peers.

**The future of organizational culture is unclear.** Lastly, we would like to express our concerns about the potential alienation from corporate cultures. Our informant from IBM describes this concern as one driver for mandatory office presence in companies: *“...People need to be in the office in the future, for at least two days a week. Because now it’s becoming a habit just [working] from home and you’re actually not part of the culture anymore”*. Companies that do not constrain where and when work can be performed may evidence days when everybody happens to be in the office and days

when everybody works remotely, synchronously or asynchronously or anything in between. Similarly, different teams or departments within the same company may have diverse agreed-upon work arrangements. Companies with flexible policies may thus evidence the full spectrum of work arrangements within the same workplace. An important question to explore in the future will be the destiny and formation of corporate culture in a workplace with flexible work arrangements.

**The different types of future organizations.** We see several development scenarios for organizations. One scenario is the emergence of organizations with distinct work policies. It is fair to expect that based on the work policies and the dominance of individual preferences and team-agreed work arrangements, we will likely see the rise of remote-first workplaces with smaller office spaces dedicated to collaborative activities. These will be organizations investing in workplaces for teams aligning on the core meetings mode, focusing on joint workshops in pre-booked team spaces or joint virtual meetings instead of personal offices. With the growing realization that way too many offices are half-empty [10], we believe that there will be organizations that will decide not only to reduce their office space but also go remote-only. Similarly, we believe that a few office-only and office-first workplaces will remain, even though evidence suggests that such companies will likely be very few [4]. Most companies, however, are likely to provide flexible/hybrid options [4, 8].

**Remaining flexible is the key.** Being flexible and not making irreversible changes in the workplace might be a winning strategy in the long term. After all, psychological and social effects of the pandemic are still guiding public opinion regarding work in the office, soon possible to swing in the other direction, as the tough economic times lean people towards office warmth and light. In any case, the spectrum of work arrangements will remain in the research focus in the years to come.

## References

- [1] Russo D, et al. Predictors of well-being and productivity among software professionals during the COVID-19 pandemic—a longitudinal study. *Empirical Software Engineering* 26.4 (2021): 1-63.
- [2] Russo D, et al. The daily life of software engineers during the covid-19 pandemic. *IEEE/ACM 43rd International Conference on Software Engineering: Software Engineering in Practice (ICSE-SEIP)*. IEEE, 2021.
- [3] Barrero, J.M., Bloom, N. and Davis, S.J., Let Me Work From Home, or I Will Find Another Job. University of Chicago, Becker Friedman Institute for Economics Working Paper, (2021): 87.
- [4] D. Smite, N.B. Moe, J. Hildrum, J. Gonzalez Huerta, D. Mendez. "Work-From-Home is Here to Stay: Call for Flexibility in Post-Pandemic Work Policies", in the *Journal of Systems and Software* (Available online Oct 28, 2022), <https://doi.org/10.1016/j.jss.2022.111552>
- [5] Fayard AL, Weeks J, Khan M. Designing the hybrid office. *Harvard Business Review*. (2021), 99(2):114-23.
- [6] Setty P, Insights from our global hybrid work survey, (2021), Available online: <https://cloud.google.com/blog/products/workspace/insights-from-our-global-hybrid-work-survey>
- [7] Appel-Meulenbroek R, Kemperman A, van de Water A, Weijs-Perrée M, Verhaegh J. How to attract employees back to the office? A stated choice study on hybrid working preferences. *Journal of Environmental Psychology*, (2022), 81:101784.
- [8] de Souza Santos RE, Ralph P, A Grounded Theory of Coordination in Remote-First and Hybrid Software Teams, *IEEE/ACM 44th International Conference on Software Engineering*, 2022.
- [9] Halford S. Hybrid workspace: Re-spatialisations of work, organisation and management. *New Technology, Work and Employment*, (2005), 20 (1): 19-33
- [10] Smite, D., Moe, N.B., Tkalic, A., Hanssen, G.K., Nydal, K., Sandbæk, J.N., Aamo, H.W., Hagaseth, A.O., Bekke, S.A. and Holte, M., 2022. Half-Empty Offices in Flexible Work Arrangements: Why are Employees Not Returning?. In proceedings of the PROFES conference, 2022.
- [11] Gratton L, How to do hybrid right. *Harvard Business Review*, (2021), 99(3): 66-74.
- [12] Beauregard TA, Basile KA and Canónico E, Telework: outcomes and facilitators for employees. In: Landers, R.N. (ed.) *The Cambridge Handbook of Technology and Employee Behavior*. Cambridge, UK: Cambridge University Press, (2019): 511-543. ISBN 9781108649636.
- [13] Thompson BY, The digital nomad lifestyle: (remote) work/leisure balance, privilege, and constructed community. *International Journal of the Sociology of Leisure* (2019), 2.1: 27-42.
- [14] Šmite D, Moe NB, Klotins E and Gonzalez-Huerta J, From forced Working-From-Home to voluntary working-from-anywhere: Two revolutions in telework. *Journal of Systems and Software*, (2022): 111509.
- [15] O'Leary MB, Mortensen M. Go (con) figure: Subgroups, imbalance, and isolates in geographically dispersed teams. *Organization science*. 2010 Feb;21(1):115-31.
- [16] Purvanova R, Kenda R, The Impact of Virtuality on Team Effectiveness in Organizational and Non-Organizational Teams: A Meta-Analysis. *Applied Psychology*. (2022), 71(3):1082-131.
- [17] Olsen M, Remote office work: Changing work patterns in space and time. *Communications of the ACM*, (1983), 26(3): 182–187.
- [18] Sullivan C, What's in a name? Definitions and conceptualisations of teleworking and homeworking. *New Technology, Work and Employment*. (2003), 18(3): 158-165.



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