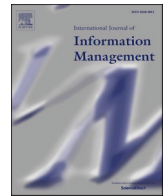




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Review

Reimagining e-leadership for reconfigured virtual teams due to Covid-19

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ABSTRACT

Driven by an unexpected transition into virtual working worldwide as a result of the Coronavirus disease 2019 (Covid-19) pandemic, in this paper, we examine the extent to which existing knowledge from the literature on virtual teams (VTs) spanning two decades can be used to inform how leadership can be exercised in the Covid-19 'new normal', involving 'reconfigured' VTs which have both similarities with, and differences from, earlier VTs. Drawing on existing literature on VTs pre-Covid-19, we explore what current (and future) VTs might look like and what this means for leadership in this new context with an emphasis on how leadership, or e-leadership, can be exercised to help the leaders of traditional, physically collocated teams that had to transition into VTs. These new e-leaders need to come to grips with a variety of new challenges in order to create high-performing and sustainable VTs. Following a semi-systematic, state-of-the-art literature review, we: (a) identify key themes and explain with a theoretical model how existing knowledge can lead to new insights for newly transitioned e-leaders; (b) discuss what future information systems (IS) researchers should focus on given the reconfiguration and new characteristics of VTs in the Covid-19 context; and (c) 'translate' the findings of our synthesis of the existing literature into prescriptive advice that can be used to inform practitioners.

1. Introduction

Information systems (IS) and management researchers have been studying virtual teams (VTs) for over two decades. Generally defined as (organisational/project) teams that are dispersed across boundaries and that collaborate via information and communication technologies (ICTs) to accomplish an organisational task or project (e.g., Townsend, DeMarie, & Hendrickson, 1998), VTs emerged due to technological capabilities and business trends for globalisation (Townsend et al., 1998). VTs became popular because of their unparalleled benefits compared to physically collocated, face-to-face (F2F) teams. These range from access to globally distributed and geographically remote talent, through to the reduction of transportation and other costs, as well as increased flexibility for employees (Ebrahim, Ahmed, & Taha, 2009). Although VTs have been around for more than two decades (e.g., Jarvenpaa & Leidner, 1999), the Coronavirus disease 2019 (Covid-19) has led to a widespread transition into virtual teamwork, often termed remote or distributed working in the literature (Venkatesh, 2020). It has also reignited interest in how ICTs can lead to work reconfigurations, enabling different ways of working, thus making new research necessary (e.g., Ågerfalk, Conboy,

& Myers, 2020; Bailey & Breslin, 2021; Chamakiotis, 2020b; Waizenegger, McKenna, Cai, & Bendz, 2020). To date (June 2021), a small number of studies have been undertaken in an effort to understand how regular, physically collocated, F2F teams turned virtual with the help of ICTs as a direct consequence of the Covid-19 outbreak (e.g., Waizenegger et al., 2020). Our argument in this paper is that, although these newly transitioned teams share some characteristics with earlier VTs pre-Covid-19, the enforced nature of virtual work that has arisen as a result of the pandemic, as well as the increasingly hybrid forms of work, require alternative leadership practices and focus (Feitosa & Salas, 2020). Leadership, or e-leadership, has been recognised as an important contributor to, and a prerequisite for, VT success in the existing VT literature (e.g., Contreras, Baykal, & Abid, 2020; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015; Larson & DeChurch, 2020). In the early literature in this field, Kerber and Buono (2004) identified the challenges facing e-leaders due to the unique characteristics of VTs. Some of these include looking at the bigger picture of the VT despite local priorities, and creating a common identity despite geographical separation. However, in the era of transition into working from home and places not traditionally associated with work, are these still

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relevant, and if so, are they the only challenges the newly transitioned e-leader is faced with?

Pre-Covid-19, a distinct characteristic of this form of organising was that VTs were essentially a choice, driven by the organisation in its efforts to access globally dispersed talent and develop collaborations regardless of time and space and to become more flexible and adaptive (Bell & Kozlowski, 2002); or by individuals due to their preference for flexible working (Igbaria, 1999). The emergence of Covid-19 in late 2019 punctuated the stable pre-Covid-19 status quo, and radically transformed the underlying structures of organisations (cf., Gersick, 1991), forcing large parts of the global working population to transition into a virtual, home-based (thus, more local in comparison to earlier VTs) working mode (e.g., Ancona, Bresman, & Mortensen, 2020). VT adoption was therefore not a choice, but rather a matter of organisational continuity and survival (Richter, 2020).

Virtual working in the Covid-19 context is characterised by several distinct features: First, newly formed VTs involve different types of employees, including those who previously either did not want to work from home (i.e., telecommute) or were not permitted to do so. Second, due to the lack of organisational readiness, employees had to rely on their own personal computing devices, software and networks for work tasks. Third, the new virtual workers were often based in environments where the workspace had to be shared with spouses, children and flat-mates, thus adding to disruptions and tensions. With schools shut and home-schooling the new norm, many individuals were unprepared both in technological and mental terms, often competing for the use of computing equipment and Wi-Fi with others in the same household, thus juggling home-schooling, homework and full-time work (Oppenheim, 2020).

While it is difficult to forecast the longer-term impacts of Covid-19 on organisations and the way we work, evidence from well-known companies in different industries — from Barclays, PwC, Unilever, Facebook and Twitter that have asked their employees to continue to work from home, through to McKinsey & Company who have suggested that the vast majority of employees prefer to work in VTs — shows that these new types of VTs are here to stay (Boland, De Smet, Palter, & Sanghvi, 2020). As a result, an increasing number of businesses signal a move away from expensive offices in an attempt to reduce their overheads (Jasper, 2020; London Chamber of Commerce and Industry, 2020). According to the Chartered Institute of Personnel and Development (CIPD), whilst home working used to be viewed as a taboo, the Covid-19 lockdown has provided the opportunity to undertake a huge natural experiment in this form of work. What we see, therefore, is large-scale digital transformations (e.g., Carnevale & Hatak, 2020; Carroll & Conboy, 2020; Fletcher & Griffiths, 2020; Venkatesh, 2020), challenging how management can be practised, and creating a need for new working practices for both team members and team leaders. Motivated by our aim to understand how the Covid-19 context is impacting e-leadership in new VTs (what we often refer to as ‘Covid-19 VTs’), in this paper, we address the following research question:

How can existing knowledge on e-leadership be applied to Covid-19 VTs and what is left to be studied?

e-Leadership constitutes an established research area within the VT literature. As Gilson et al. (2015, pp. 1319–1320) put it, “[e-]leaders may play a central role in VT functioning, particularly as they influence how a team deals with obstacles and how the team ultimately adapts in the face of such challenges” reinforcing the need for effective leadership in times of crisis, as it is the case with the current Covid-19 pandemic. Industry reports from McKinsey & Company and Deloitte, among others, have explicitly stated some of the challenges facing traditional leaders who

had to transition into VT e-leaders; they include promoting new e-leadership styles, managing work-life boundaries, and ensuring VT members’ well-being (Comella-Dorda, Garg, Thareja, & Vasquez-McCall, 2020; Deloitte, 2020). Though much can be learnt from prior VT literature, where numerous scholars have examined ICT-mediated interactions among dispersed team members (e.g., Kayworth & Leidner, 2002), our position is that new forms of VT configurations make the rethinking of e-leadership practices essential in order to enable organisations to lead effectively in the new work environment (Carroll & Conboy, 2020). With our work, we extend recent attempts to explore e-leadership (Contreras et al., 2020) or remote/virtual working (Richter, 2020) in the Covid-19 context, by taking into consideration the enforced and more local character of newly formed VTs, and their unique configurational characteristics that distinguish them from earlier VTs. As Waizenegger et al. (2020, p. 429) put it, “[enforced working] impacts people who never had any desire to or were not permitted to [work virtually] due to organisational policies.” Our view is that this is a unique feature of the Covid-19 context that has an impact on how leadership can be exercised, and which previous studies have not explicitly addressed. To achieve our objective, we present a semi-systematic, state-of-the-art review (Grant & Booth, 2009; Snyder, 2019) of the VT literature on e-leadership with the aim of exploring how existing knowledge can be used to inform contemporary IS and management scholarship and practice.

Given that leadership is viewed as a prerequisite for high-performing and sustainable VTs (e.g., Contreras et al., 2020; Gilson et al., 2015; Larson & DeChurch, 2020), we take a closer look into the topic of leadership within the VT literature, and draw connections between recognised themes and challenges facing VTs (e.g., trust, creativity) in our attempt to explore how leadership can be exercised to support VT workers in Covid-19 VTs. Leadership constitutes a rich field in its own right, which has been studied from different perspectives; here, we explore leadership practices in the existing VT literature with the aim of understanding how leaders of traditional, physically collocated teams can transition into e-leaders, i.e., leaders of Covid-19 VTs. Our study contributes key themes in relation to e-leadership, which will be of value to IS, information management (IM), Human Resources (HR), and general management scholars, practitioners, policy makers, as well as to educators interested in understanding how existing knowledge from the VT literature can be applied to the current context where most of us will have to work virtually to some degree.

In what follows, we first present the field of e-leadership in the VT context (Section 2), and detail our methodological approach to reviewing this field (Section 3). We continue with explaining what the impact of Covid-19 has been on VT reconfiguration/characteristics (Section 4) before we present the themes that emerged from our analysis and the new areas for future research (Section 5). Following this, we draw on these themes to develop our theoretical model which leads to one general proposition on *what* newly transitioned leaders should do, and two specific propositions on *how* they should do it (Section 6). Finally, we reflect on the contributions of our paper and outline a set of practical recommendations designed to guide team leaders’ transition into VT e-leaders, as well as HR practitioners who may want to use our findings to update their organisational policies in response to Covid-19 (Section 7).

2. e-Leadership and VT adoption

VTs consist of globally dispersed members who assemble to work virtually on a specific project and then disassemble (e.g., Townsend et al., 1998). VTs have attracted cross-disciplinary academic and

practitioner attention over the last 20 years (Axford, Askill, & Jones, 2002; Barlow & Dennis, 2016; Davison, Fuller, & Hardin, 2003; Fuller, Hardin, & Davison, 2006; Jarvenpaa & Leidner, 1999; Kayworth & Leidner, 2002; Sivunen & Valo, 2006; Zimmermann, 2011). Researchers have studied the opportunities and challenges associated with VTs (Ebrahim et al., 2009; Handy, 1995), discussing the impact of discontinuities, i.e., factors that contribute to inconsistencies and incoherence among team members, such as cultural and language diversity (Hardin, Fuller, & Davison, 2007; Sarker & Sahay, 2004), organisational, work and even technological differences (Asatiani, Hämäläinen, Penttinen, & Rossi, 2021; Watson-Manheim, 2019). There is agreement that e-leadership in VTs is different from leadership in traditional, physically collocated teams. For example, Gibson, Huang, Kirkman, and Shapiro (2014) highlight e-leaders' multifaceted role in the *global* VT (GVT) context with tasks ranging from choosing ICTs in line with the cultural idiosyncrasies of the VT members, through to creating a psychologically safe (virtual) work environment and inciting a sense of collectivity and meaningfulness. Zander, Mockaitis, and Butler (2012), on the other hand, see e-leaders as boundary spanners, bridge-makers and blenders, as they play a key role in promoting motivation and commitment. In their attempt to identify effective leadership practices, researchers have presented key phases of the VT lifecycle and, within each phase (i.e., welcoming, performing and wrapping up), the practices that leaders should adopt in terms of facilitating interactions, developing synergies and improving overall team performance (Collins, Lawrence, Troth, & Jordan, 2013; Zander, Zettinig, & Mäkelä, 2013). The ability to develop trust among VT members, a noticeable attribute within effective VTs (Brown et al., 2004; Germain & McGuire, 2014; Jarvenpaa & Leidner, 1999; Panteli & Duncan, 2004; Panteli & Tucker, 2009), has been shown to be a characteristic of effective VT leaders (Malhotra, Majchrzak, & Rosen, 2007; Zander et al., 2013).

Paradoxically, therefore, although VTs have been seen as ideal work configurations for organisations to boost their performance, the same characteristics that can contribute to such improvements may also give rise to discontinuities. Watson-Manheim, Chudoba, and Crowston (2002) define discontinuities — such as geographical separation, time-zone, culture, work practices, organisation and technology — as factors contributing to lack of cohesion between VT members. Cohesion has consequently been recognised as an important aspect of VT success and an essential component of intra-team socio-emotional processes (Dixon & Panteli, 2010; Powell, Piccoli, & Ives, 2004).

Several views exist on appropriate e-leadership styles in the VT context. With reference to the transformational/transactional leadership framework (Bass, 1985), Ruggieri (2009) argue that transformational leadership, which is characterised by inspirational motivation and individualised attention, is more suitable for VTs than the transactional leadership style which relies on rewards and punishment depending on goal achievement. Similarly, Purvanova and Bono (2009) find that transformational leadership has a stronger effect on team performance when used in the VT context than the traditional F2F context. Additionally, e-leadership may be more shared in nature (Carson, Tesluk, & Marrone, 2007), especially in GVTs characterised by high levels of cultural/national heterogeneity (Gibson et al., 2014), and alternative leadership styles might be more effective (e.g., Charlier, Stewart, Greco, & Reeves, 2016; Larson & DeChurch, 2020). Though the role of a central, formally appointed leader (Kerber & Buono, 2004) may still be useful in trying to manage the centrifugal forces emerging from the VT discontinuities (e.g., time differences, conflicting local priorities between subgroups), or for assuming the formal responsibility for a project, the central leadership approach works best when combined with other leadership styles. Carson et al. (2007) argue that having multiple

leaders 'from within' leads to higher levels of performance and benefits that exceed the work tasks in question. Taking these findings a step further, Chamakiotis and Panteli (2017) argue that different members may emerge as leaders due to their expertise in a specific task. These emergent leaders may (informally) assume the responsibility for a specific task and then bestow their leadership position to someone else as the VT lifecycle unfolds (an example of *shared leadership*), or work in parallel with another member who has assumed the responsibility for another task that is being accomplished at the same time (an example of *co-leadership*). Therefore, shared leadership is *successive* in nature, whereas co-leadership is *simultaneous*. Furthermore, leaders who emerge during the VT lifecycle from within the team in a collectively approved fashion (e.g., Charlier et al., 2016) tend to be more successful than those who are formally appointed or organisationally sanctioned due to expertise or political credentials (Chamakiotis & Panteli, 2017). What these findings show is that although a traditional, central leader may still be needed (Kerber & Buono, 2004), in the VT environment, leadership may be exercised by additional individuals within the team, leading to more than one leadership style at the same time.

Overall, and regardless of the way they emerge or their style, e-leaders are deemed to be critical to the successful completion of the task at hand. In the following section, we present our methodological approach.

3. Methodology

3.1. A semi-systematic, state-of-the-art literature review approach

We conducted a literature review to overview the state-of-the-art in the area of e-leadership in VTs, with the twofold aim of identifying what can be applied to current Covid-19 VTs based on existing knowledge, and what remains to be studied in the Covid-19 VT context. We selected the semi-systematic (Snyder, 2019), similar to the state-of-the-art literature review approach (Grant & Booth, 2009), because we used an existing literature, that of VTs, in order to explore whether, and to what extent, it can be useful in understanding the Covid-19 VT context. This method of conducting a literature review offers “*the ability to map a field of research, synthesise the state of knowledge, and create an agenda for further research*” (Snyder, 2019, p. 335); and “*new perspectives on an issue*” (Grant & Booth, 2009, p. 105), rendering it suitable for exploratory studies like the one presented here. On the contrary, other, more popular approaches, such as the systematic literature review (SLR), based on more quantitative methods and exhaustive searching (Grant & Booth, 2009), aim to generate evidence of effect to inform policy/practice (Snyder, 2019). Our approach is therefore consistent with our research aim and question, presented above. Contrary to the SLR, which requires strict rules and specific inclusion/exclusion criteria, to define our search, we used (broader) criteria in terms of: *field of study* (i.e., IS/IM, management (including HR) and leadership, organisation studies and organisational behaviour/psychology); *source* (i.e., primarily peer-reviewed journal articles, but also industry reports and the professional/popular press); and *topic* (i.e., different types of VTs, e-leadership styles, practices and challenges, and Covid-19). A total of 80 academic papers and several non-academic sources were reviewed (see examples in Table A1 in the Appendix) based on those criteria. We followed the following four phases: *design* (i.e., development of rationale and study objectives); *conduct* (i.e., active search, article selection, storage and overview); *analysis* (i.e., thematic analysis approach leading to four themes); and *structuring and writing up* (i.e., development of four overarching themes) (Snyder, 2019, p. 336).

Table 1
Global vs. local VTs.

VT configurations	Characteristics	Example sources
Global VTs (or GVTs) dominated the literature pre-Covid-19	<ul style="list-style-type: none"> • Temporary teams • Globally dispersed • Inter-organisational (with limited organisational project identity) • Often purely virtual (no F2F communication) • Office-based from different geographical locations • More stable membership • High levels of diversity/heterogeneity <ul style="list-style-type: none"> ◦ Cultural ◦ Language ◦ Organisational 	(e.g., Crisp & Jarvenpaa, 2013; Kayworth & Leidner, 2002; Majchrzak, Rice, Malhotra, King, & Ba, 2000; Panteli & Duncan, 2004)
Local VTs are expected to increase in popularity in the Covid-19 context	<ul style="list-style-type: none"> • Established/permanent/polychronic teams • Locally (or nationally) dispersed^a • Intra-organisational (with high degrees of organisational identification) • Hybrid (with some F2F communication) by default • Home- (rather than office-) based • More dynamic membership • Low levels of diversity/heterogeneity 	(e.g., Boland et al., 2020; Chamakiotis, 2020b; Jasper, 2020; Russon, 2020) ^b

^a Geographical dispersion exists because of the enforced travel restrictions and social distancing. Covid-19 VTs are locally dispersed and hence diversity/heterogeneity are relatively low in comparison with GVTs.

^b Sources here are not academic, but they come from industry reports and the professional/popular press as no academic studies explicitly mentioning these characteristics have been published yet.

3.2. Thematic analysis of the literature

As mentioned above, and in Table A1 in the Appendix, our focus was cross-disciplinary. We considered primarily empirical studies (irrespective of methodological approach or research setting), although other literature review articles were taken into consideration as well (e.g., Gilson et al., 2015; Larson & DeChurch, 2020). Academic literature formed the bulk of our collected material; however, we also considered practitioner literature in the area where this was highly relevant (e.g., Panteli & Tucker, 2009), as well as industry reports (e.g., Deloitte, 2020). Initially, we reviewed the lead author’s 12-year-old bibliographic library on Zotero, a popular reference management programme, which was later updated with newer academic literature in the area. This included primarily studies that were published as a result of the Covid-19 pandemic and the emergent forms of working involving technology mediation, in IS (e.g., Waizenegger et al., 2020) and general management journals (e.g., Bailey & Breslin, 2021). As part of this update, we also considered industry reports, as mentioned above, as well as the professional/popular press that spoke about Covid-19 and its impact on work practices.

Our thematic analysis (phase 4 of our review) was influenced by phases 3-5 suggested by Braun and Clarke (2006): *theme search*, *theme review* and *theme definition/naming*. Given that we were already familiar with this literature, we explored studies that satisfied the criteria outlined in 3.1 above. Our initial search returned studies on different aspects of leadership or the leader him/herself, including leadership behaviour (e.g., Zander et al., 2013) or leadership styles (e.g., Zhang,

Fjermestad, & Tremaine, 2005). This body of literature formulated the foundation of our work and helped us understand how leadership in VTs differs from that in traditional F2F teams. In coding the different articles (phases 3 and 4 of the thematic analysis), which was first performed manually by the lead author and was later discussed with the rest of the team numerous times, we elicited relationships between leaders and individual members (e.g., well-being, work-life boundaries) as well as leadership and team relationships (e.g., trust, cohesion) and performance (i.e., creative performance and innovation). Our study is not just a review study, but it was motivated by the Covid-19 pandemic and therefore the professional/popular press played a role in helping us identify themes; for example, the issues of well-being (Deloitte, 2020), burnout (Oppenheim, 2020) and ICT use (Sugden, 2020) have received significant attention recently and therefore contributed to us reviewing studies that do not directly form part of the VT literature (e.g., Bakker & Demerouti, 2007). These more detailed themes are presented in Section 5 below. Each theme reviews existing literature and identifies areas that require further research due to Covid-19.

Before we proceed to the presentation of the four themes, we present the configurations and characteristics of VTs in the Covid-19 context which, as we argue, render them different from earlier VTs that have dominated the research literature to date.

4. The impact of Covid-19 on VT reconfiguration and characteristics

The VT literature recognises that VTs differ along four dimensions: *geographical dispersion* (global vs. local); *relation to the organisation* (inter- vs. intra-organisational); *degree of continuity* (generally understood as a continuum from temporary to permanent); and *degree of virtuality* (purely virtual via hybrid to purely F2F) (Griffith, Sawyer, & Neale, 2003). Our view is that virtual work is not a binary issue and that, indeed, teams vary in terms of their degree of virtuality (Dixon & Panteli, 2010; Griffith et al., 2003). However, we argue that VTs in the Covid-19 context have some distinct characteristics which we focus on in this section. These characteristics are not completely new; for example, locally dispersed VTs existed pre-Covid-19 as well. However, the characteristics discussed here (outlined in the last (third) row of Table 1) *in tandem* lead to reconfigurations. Formerly, researchers had been fascinated about GVTs in particular. A GVT was a VT with *globally* dispersed members who joined on a temporary basis to work on a specific project or task. The members may not have identified with the organisation or the project due to their limited involvement, but they often added diversity to the team in terms of culture, language, organisational background and technology experience (Table 1). Many scholars (e.g., Hardin et al., 2007; Jarvenpaa, Knoll, & Leidner, 1998; Jimenez, Boehe, Taras, & Caprar, 2017; Kayworth & Leidner, 2002) have focused on GVTs (e.g., temporary, global, diverse, inter-organisational); however, these may not be representative of how all VTs operate. Table 1 is useful because it juxtaposes GVTs that the existing literature has primarily focused on with Covid-19 VTs which, despite some similarities, have significant differences.

Therefore, whilst the earlier VT literature has focused on GVTs, in the Covid-19 context, we are witnessing a vast increase in VTs that are primarily local, involving the same members who used to work together in the office. Covid-19 VTs are thus characterised by low levels of geographical dispersion, and by extension, limited diversity in terms of time-zone, culture, language and organisation. Ancona et al. (2020) observe that virtual work pre-Covid-19 was a working environment for a few — those who were part of GVTs or those who chose to work virtually — whereas now it is a working environment for a large part of the working population. Further, these teams are generally intra-organisational and therefore their members have a high degree of identification with the same organisation. In terms of the degree of continuity, Covid-19 VTs are primarily permanent, continuing the line of work previously undertaken in the office. However, these newly

configured Covid-19 VTs are also characterised by dynamic membership, i.e., with VT members coming and going frequently, joining half-way through the VT lifecycle, or multi-teaming (Ancona et al., 2020). Given that there has been F2F collaboration, and it is likely that members will continue to have limited F2F contact (e.g., by working in the office occasionally), Covid-19 VTs are hybrid by default (i.e., combining both F2F and virtual collaboration to different degrees). Given, however, that Covid-19 VT members work primarily from home, this contributes to the blurring of work-life boundaries in unprecedented ways (Powell, 2020), making it potentially harder for some to engage with work, home-schooling, domestic and other activities (Oppenheim, 2020), and creating the need for updated HR policies to protect virtual workers' (digital) well-being (Papagiannidis, Harris, & Morton, 2020). Since Covid-19 VTs are configured differently, we echo other commentators who highlight that Covid-19 VT e-leaders should be adaptable, appreciative of differences characterising the Covid-19 VT context, and able to act as the glue between VT members (e.g., Feitosa & Salas, 2020).

VTs will continue to be a dominant way of working (e.g., Ancona et al., 2020; Barnes, 2020; Carnevale & Hatak, 2020; Carroll & Conboy, 2020; Feitosa & Salas, 2020). Given, however, the unique configuration and characteristics of Covid-19 VTs, explored above, in the following section, we examine how the earlier (G)VT literature may inform e-leadership practices of the reconfigured VTs in the Covid-19 context wherein we see leaders of traditional, F2F teams transition into e-leaders, i.e., leaders of VTs, expected to enact their roles effectively in a technology-mediated setting. Transformational leadership approaches, involving clear direction, constructive feedback, as well as encouragement and empathetic and motivating language, helped the home-bound virtual workers to become more engaged and to increase their work commitment despite the distance that separated them from their colleagues. While in lockdown, with often the whole family unit in confinement and close proximity, flexible, ICT-enabled working became the norm. Powell (2020, pp. 641-642) terms this 'family lockdown' to indicate the added challenge in achieving some sort of work-life balance; as he puts it, "if [Covid-19 VT workers] have school-age children, they may need to devote time to home-schooling and otherwise keeping their children occupied while still working at the same level as before. If they have a household partner, they may have to deal with the partner's work lockdown, which provides further potential for family interruptions and distractions. Thus, the current pandemic is likely to have increased telecommuters' family-to-work conflict". Additionally, Covid-19 VTs have led to the emergence of new phenomena, such as evidence of technology fatigue, and commentators speaking about how specific technologies might contribute to that, as it is the case with 'Zoom fatigue' (Sugden, 2020). Consequently, Covid-19 VT e-leaders should be equipped not only to understand the unique configuration and characteristics of Covid-19 VTs, but also to identify and address the unprecedented challenges associated with this type of work. Davison (2020) argues that, in times of disruption, such as the Covid-19 crisis, leaders should rise to the challenge and create a 'new normal' that is really new, not just a replica of the old.

In response to the above, we came up with four broad themes that can help Covid-19 VT e-leaders look after their VT members in the current context.

5. Four themes of e-leadership in Covid-19 VTs: lessons from the pre-Covid-19 VT literature and directions for future research

Our analysis of the existing literature led to four thematic areas, which we call 'themes' for simplicity, that Covid-19 VT e-leaders should become familiar with: (a) digital well-being; (b) engagement, trust development and relationship building; (c) maintaining (or recreating) work-life boundaries; and (e) creative performance and innovation. In each of these themes below, we present what we can learn from the

existing, pre-19 (G)VT literature and what future researchers could seek to investigate. Our future research directions are presented at the end of each sub-section, along with some thoughts as to what possible findings could emerge.

5.1. e-Leadership for digital well-being

Drawing on 'Media Synchronicity Theory' (Dennis, Fuller, & Valacich, 2008), not all ICTs are equally good for all types of task; rather, ICTs should be selected based on their degree of synchronicity (from very lean ICTs such as asynchronous servers and email, through to richer and more synchronous ICTs) and the type of task at hand (DeLuca & Valacich, 2006), and it is the e-leader's responsibility to define which ICTs will be used in a VT (Zander et al., 2013). Covid-19 has demonstrated that pertinent ICT selection is paramount given that it may lead to unprecedented phenomena, such as 'Zoom fatigue' (Sugden, 2020), suggesting inappropriate ICT use, potentially impacting workers' well-being and performance. The concept of technostress is likely to be linked to that, i.e., the stresses associated with ICT-based work (Tarafdar, Pullins, & Ragu-Nathan, 2015). e-Leaders need to be aware of the potential for their team members to become victims of technostress, and indeed for this to become a more common situation when almost all F2F interactions are replaced with online interactions.

Well-being has been recognised as significant for VT effectiveness (Adamovic, 2018) and in the current context (Carnevale & Hatak, 2020). A dominant model within the well-being literature is the Job Demands-Resources (JDR) model which argues that the organisational aspects of any job can be categorised as either *job demands* (i.e., job elements that require effort and are intensified by such factors as uncertainty and overload) or *job resources* (i.e., job aspects that are useful in getting the job done, including job security and role clarity, among others) (Bakker & Demerouti, 2007). The JDR model highlights that there needs to be a balance between its two elements. Otherwise, if job demands exceed job resources, workers might be led to overload and eventually burnout (Tarafdar et al., 2015).

To date, we lack understanding around how the JDR model plays out in the context of VTs whereby the organisational or geographical discontinuities (Asatiani et al., 2021; Watson-Manheim, 2019), among others, might intensify some of the demands facing workers. Researchers have recently observed that contemporary work arrangements involve a largely unrecognised and invisible volume of work, termed 'digital-housekeeping' (Whiting & Symon, 2020), involving a set of 'invisible' activities (e.g., organising one's inbox, sorting files, clearing junk emails), thus potentially adding more demands onto the virtual worker's to-do list. Additionally, Cañibano, Chamakiotis, and Russell (2020) suggest that increasing demands in the Covid-19 VT context include role conflict (e.g., due to working from home) and emergence of new roles (e.g., teacher of home-schooled children), both being common situations in times of crisis, as it is the case with Covid-19. The same authors note that, in the Covid-19 VT context, increasing demands may be coupled with reduced resources, for example, reduced informal interactions with colleagues who normally serve as a support network for workers.

Future research could explore how the unique characteristics of the new VTs can be understood in the prism of the JDR model and what e-leaders could do to ensure: (a) that job demands do not exceed the available job resources in Covid-19 VTs; and (b) that suitable leadership practices can be employed to avoid technostress (Tarafdar et al., 2015) and burnout (Oppenheim, 2020). It is likely that having a plan or a specific policy in place to define the duration of ICT-mediated calls could help to ensure that no excessive time is spent on virtual meetings that could lead to overload. In the home-working environment, job demands and resources are blended with the demands and resources of the household, potentially impacting workers' level of engagement too, which we explore next.

5.2. e-Leadership for engagement, trust development and relationship building

Covid-19 VTs are seen to cause high uncertainty for workers, putting their engagement at stake (Australian Psychological Society, 2020). Employee engagement in VTs constitutes a significantly underexplored area of study, with Panteli, Yalabik, and Rapti (2019) highlighting the importance of the supportive behaviour of the e-leader in fostering employee engagement in VTs pre-Covid-19. In particular, these authors find that appropriate information and financial provision, as well as mental support, encouragement and feedback are key resources for fostering employee engagement in VT projects. They also posit that — because of VT members' dispersion and their ICT-mediated communication — developing employee engagement needs to be an ongoing effort that should be evident and supported across the different phases of the project. In a more recent study, Gibbs, Gibson, Grushina, and Dunlop (2021) emphasise the importance of interaction and communication in GVTs, arguing that they have the ability to diminish the importance of status differences between GVT members, and, by extension, influence GVT members' participation and engagement. While these findings are important, we need to explore how worker engagement is cultivated in Covid-19 VTs whereby high levels of uncertainty, impromptu lockdowns, and travel restrictions might influence not only the mode of work (e.g., purely virtual or hybrid), but also workers' psychological well-being over time.

Trust played a dominant role in the pre-Covid-19 VT literature (e.g., Germain & McGuire, 2014; Jarvenpaa et al., 1998), with a widespread recognition among researchers and practitioners that it constitutes a redeeming element for the embedded discontinuities of virtual work, discussed above (e.g., Watson-Manheim, 2019). The general argument in this body of work is that high-trust VTs are more cohesive and lead to higher levels of performance. Some researchers have therefore studied the relationship between trust and leadership in VTs (DeRosa, Hantula, Kock, & D'Arcy, 2004; Hacker, Johnson, Saunders, & Thayer, 2019). For instance, Hacker et al. (2019) underline that e-leaders should constantly monitor and cultivate a culture of trust between VT members and also between VT members and themselves. Overall, despite a noteworthy emphasis on the issue of trust over the years, what the literature lacks, which we see as paramount in the Covid-19 context, is an understanding of building and maintaining social relationships within VTs; this is more than just promoting a culture of trust in a VT environment. Although Covid-19 VTs consist of members who share prior F2F working experience, and possibly have established relationships, the question is: how could these relationships be strengthened within the Covid-19 VT context? For instance, there is a vast, and largely untapped literature into the social phenomenon known in Chinese societies as *guanxi* (Chen, Chen, & Xin, 2004). *Guanxi* emphasises the primacy of the interpersonal relationship, very often in team settings, and introduces the idea that team members will seek to promote intra-team harmony, respect, affection, reciprocity and the sense of responsibility for what is good for the team, as a group, and its members, as individuals (Chen, Chen, & Huang, 2013; Ou & Davison, 2016). This approach to team-level psychological health could be central to a new appreciation of how VT members, and e-leaders, need to look out for each other's interests, and a move away from 'what is good for me' to 'what is good for the team'.

Future research in this area could take a number of directions, for example, by using the JDR framework to specifically examine how job demands and resources influence e-leadership practices, and how that, in turn, may influence engagement levels in Covid-19 VTs. We envisage that this will differ within different sectors and industries with some sectors, such as education, experiencing significantly higher demands (e.g., conversion of teaching methodologies into online formats), without enhanced resources (i.e., while working from home). Although prior research into VTs in China has not explored the emergence and development of *guanxi* (e.g., Zhong, Huang, Davison, Yang, & Chen, 2012), future research could study how VTs can develop *guanxi* in order to

strengthen intra-team cohesion, perhaps through the lens of transactive memory theory which suggests that each member of the team is familiar with the expertise of all other members (Wang, Huang, Davison, & Yang, 2018). Consequently, while existing findings on trust could still be useful, future research should place emphasis on issues that have so far been neglected and which could include *guanxi* and allied social concepts such as reciprocity, responsibility, respect and harmony.

5.3. e-Leadership for maintaining (or recreating) work-life boundaries

Further to the socio-emotional processes that take place *within* the VT environment, such as trust (Powell et al., 2004), in the Covid-19 context, it is equally important to study exogenous factors that may impact virtual working. The Covid-19 context is a blurred environment in which work, domestic, family and social activities occur, and the boundaries, within which we, as individuals, undertake those activities (Ashforth, Kreiner, & Fugate, 2000), are more permeable (e.g., Ancona et al., 2020; Chamakiotis, 2020b; Powell, 2020). Traditionally, these boundaries have been spatial (e.g., with work taking place in the office) and temporal (e.g., between 9 and 5 for certain workers). However, the proliferation of ICTs has led to the development of new theories, such as the integration-segmentation model, suggesting that some individuals (known as *integrators*) choose to integrate their work with non-work activities, while others prefer to keep the two separate regardless of how, when or where they work from (known as *segmenters*) (Nippert-Eng, 1996). Over time, such theories have been expanded, for example, with Mustafa and Gold (2013) arguing that establishing some sort of physical boundaries, even if working from home or in a space not designated for work, is paramount for managing temporal boundaries and achieving a healthy work-life balance.

The Covid-19 context introduces new challenges — such as 'family lockdown' (Powell, 2020) explored earlier — which problematise the management of work-life boundaries further, by adding one more layer of complexity: the merger of additional domains. Scholars who have looked into how ICTs (or ICT connectivity) might influence the management of work-life boundaries may have been driven by the assumption that technology has the potential to blur the boundaries of two domains (work and non-work (or personal) life) (Schlachter, McDowall, Cropley, & Inceoglu, 2018). However, the Covid-19 context involves the merger of multiple domains with two or more individuals within a family working simultaneously together within the same household, and possibly involving childcare (and other, e.g., caring) responsibilities at the same time.

We therefore raise the following questions that future researchers could address: how can the simultaneous merger of multiple domains coexist? Are traditional theories about work-life boundaries that are based on spatial and temporal division of domains still relevant, or do we need to reimagine what work-life boundaries may look like in the Covid-19 VT context? Furthermore, what practices are necessary in order to manage work-life boundaries within this new (work-life) context, ensuring highly performing workers that do not violate their work-life boundaries in a context wherein multiple domains coexist? Our estimation is that the answer will be that work life will be more hybrid in nature and new types of practices will be necessary for both e-leaders and members of VTs to manage not only their work, but also their life outside work, effectively.

5.4. e-Leadership for fostering creative performance and innovation

While earlier VT literature focused on the issue of performance (e.g., Powell et al., 2004), recently we have seen a shift into *creative* performance and innovation (e.g., Chamakiotis, 2020a). Drawing on relevant literature on creativity in VTs (e.g., Kratzer, Leenders, & Van Engelen, 2006; Nemiro, 2007), we define creative performance as the process by which a VT can generate creative ideas, methods, ways of working, with the potential of creative innovative outputs. On the one hand, VTs have

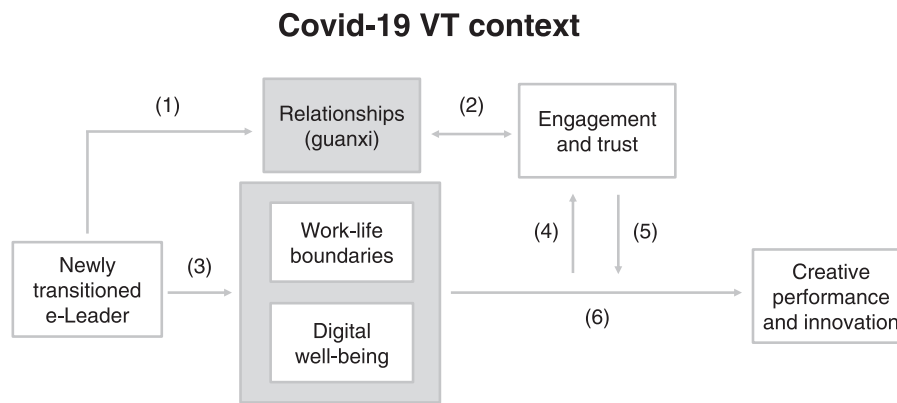


Fig. 1. e-Leadership in the Covid-19 VT context.

been seen as environments that foster creative performance, and by extension, innovation (Shachaf, 2008). On the other hand, however, the Covid-19 context, with the home-work blended environment being the norm, raises new questions for future research. Early work in this area focused on prerequisites for VT creativity, such as interpersonal and task connection (Nemiro, 2007) and factors that either enhance (e.g., stimulating colleagues) or inhibit (e.g., dominance) creativity in VTs (Ocker, 2005). Chamakiotis, Dekoninck, and Panteli (2013) shed light explicitly on how the unique characteristics of VTs (e.g., the level of ICT synchronicity) might enhance or inhibit creativity, stressing that management plays an important role in leveraging some of the benefits that VTs are known for. For example, both synchronous and asynchronous ICTs have different capabilities that can be used to support different aspects of creativity: *synchronous* ICT-mediated sessions could allow for real-time brainstorming, while *asynchronous* ICTs, on the other hand, could allow individual members of VTs to be creative irrespective of their teammates' availability, for instance, by storing their ideas on an asynchronous server like Dropbox when others are not around. Likewise, the increased levels of member heterogeneity we see in GVTs (e.g., in relation to disciplinary or cultural background) could influence creativity positively (by bringing more diverse ideas to the table) or negatively (by leading to language misunderstandings, delaying the creative process). These findings show that suitable e-leadership and management practices are paramount for the enhancement of creativity in (G) VTs.

Some of this literature has shown that Industry-Academia collaboration projects constitute ideal inter-organisational VT environments for creativity and innovation, as they combine industrial expertise and fresh ideas coming from university students or recent graduates (Chamakiotis & Panteli, 2017; Chamakiotis, Boukis, Panteli, & Papadopoulos, 2020). Innovation constitutes one of the reasons why traditional VTs pre-Covid-19 were assembled; they brought together global talent across boundaries as a way of increasing the possibilities of a team to come up with innovative outcomes (Gibson & Gibbs, 2006). The innovation literature is multifaceted, exploring different types of innovation, e.g., at the team, organisation or industry levels. Within the VT context, there is only one study on this topic which sees innovation as a team output and explores the factors influencing innovation at the early stages of the innovation process, what is known as the fuzzy front-end (FFE) of innovation (Chamakiotis et al., 2020).

With the new work configurations and an increasing percentage of the workforce working remotely, future research in this area could explore: How can creativity and innovation be fostered among the dispersed employees in the Covid-19 context? How can the newly transitioned e-leaders enhance and support creativity and innovation despite the challenges associated with working from home? And what types of innovation (other than innovation as an output) can emerge in this context?

6. Theoretical model and propositions

Following the identification of the key themes linked to Covid-19 e-leadership, a theoretical model is developed that shows the inter-relationships between those themes (Fig. 1). As the model shows, in the Covid-19 VT context where new VT configurations have become evident, we see the emergence of the newly transitioned e-leader, a person who pre-Covid-19 was a collocated leader and because of Covid-19 and the new way of working had to transition to an e-leader. As argued earlier, e-leadership plays a driving role in enabling and enhancing the creative performance of the dispersed, home-bound organisational workers. According to the VT literature pre-Covid-19, developing employee engagement (Panteli et al., 2019) and trust (e.g., Powell et al., 2004) are recognised conditions for successful work performance. Nevertheless, the Covid-19 VT context requires adaptation among the newly transitioned e-leaders. Therefore, while engagement and trust have been previously recognised, in the Covid-19 context, it is the *relationship* aspect that matters, e.g., *guanxi* (#1), which ultimately has a bidirectional relationship with engagement and trust (#2), and is presented as a separate theme in the model.

Moreover, workers' digital well-being and their work-life boundaries are added responsibilities for the VT e-leader (#3). Looking after workers' digital well-being and work-life boundaries in the new context helps to strengthen VT members' engagement and grow their trust in the organisation (#4), and ultimately contributes to successful and creative VT performance (#5, #6). Our contention is that, without them, Covid-19 VTs might be at stake.

Based on our model, in what follows, we present relevant propositions:

In the Covid-19 context, VT members face increased challenges with increasing demands (and not necessarily more resources), shared workspaces with individuals outside their work domain, e.g., family and/or flatmates, and caring commitments that may disrupt work activities and vice versa. A 'hybrid' environment is created whereby work, non-work, virtual (with colleagues) and F2F (with family/flatmates) coexist in the same space, while invisible (and unrecognised from an organisational perspective) tasks have emerged too (see Section 5.1). Coexisting in a new hybrid environment generates the danger of allowing work to dominate life outside work, while trust may be at stake when VT members are not visible or available. Thus, we develop a general proposition (on *what* e-leaders should do) and two specific propositions (on *how* they should do it):

General Proposition: Newly transitioned VT e-leaders should adapt their practices to accommodate the (additional) challenges and characteristics of the VT configurations in the Covid-19 context.

In the pre-Covid-19 era, leaders of traditional (and virtual) teams focused on the factors that the team management literature had identified as influencing team performance, for example, trust and

engagement. While these are still important factors in creating a suitable work environment for high-performing teams, in the Covid-19 context, they are not sufficient; relationships, digital well-being and work-life boundaries appear to be prerequisites too. Therefore, we make the following specific propositions in order to explain *how* e-leaders should adapt their practices:

Specific Proposition 1: Promoting relationships via guanxi principles can lead to growing VT member engagement and trust towards the organisation among the Covid-19 VT members. As argued earlier, although engagement and trust have been on the e-leader's agenda pre-Covid-19, in the current context, which is characterised, among others, by uncertainty, mixed (hybrid) workspaces, Zoom fatigue and possibly a reduced sense of well-being, relationships appear as an additional prerequisite for attaining high levels of work engagement and intra-team trust. Capitalising on the existing relationships of the same team members in the pre-Covid-19 F2F team environment, e-leaders of newly transitioned VTs could consider adopting the principles of guanxi in their effort to ensure their VT members are engaged and maintain high levels of trust with one another.

Specific Proposition 2: Covid-19 VT e-leaders should look after their members' digital well-being and work-life boundaries as these have an (indirect) effect on their levels of engagement and trust (and, by extension, relationships), and are directly linked to the team's creative performance and innovation. Given today's emphasis on creative performance and innovation, workers need to have: (a) the necessary resources; and (b) work-life boundaries in place in order to be able to work effectively and creatively. Therefore, e-leaders should make sure their VT members' demands (including invisible tasks characterising the new VT environment) are not greater than the resources available, while showing flexibility in terms of *when* and *how* they work given the hybrid and simultaneous coexistence of multiple work and non-work domains.

7. Conclusion and implications for practice

Contrary to what other commentators have argued, i.e., that the Covid-19 'new normal' will lead to completely new ways of working, in this paper, we argue that much can be learnt from the existing literature on (G)VTs pre-Covid-19. However, the Covid-19 pandemic has led to a reconfiguration of this form of work (e.g., Fletcher & Griffiths, 2020), urging us to make new connections (discussed in Section 6), and also making new research necessary to promote theoretical understanding around how IS have engendered new ways of (virtual/remote) working in the Covid-19 VT context. Following a recognition in the VT literature that e-leadership plays an important part in VTs' effective functioning (e.g., Carroll & Conboy, 2020; Contreras et al., 2020; Gibson et al., 2014; Larson & DeChurch, 2020), we have reviewed the literature on e-leadership in VTs and have identified four themes which reveal what leaders of traditional, F2F teams who had to transition into VT e-leaders can take away from this body of existing knowledge in order to create high-performing and sustainable VTs in the Covid-19 context. In developing a theoretical model (Fig. 1), we contribute new insights in this area, identifying three types of factors: (a) those that we knew from the VT literature pre-Covid-19 (i.e., trust and engagement); (b) those that we knew from before too but whose meaning and significance have changed (i.e., relationships/guanxi); and (c) new ones related to the Covid-19 context explicitly (i.e., work-life boundaries and digital well-being). By explaining how these play out in the Covid-19 context, we formalised a general proposition and two specific propositions for newly transitioned e-leaders in particular and for e-leaders in general. We have also outlined a number of directions for future research, presented at the end of each of the four areas, which IS researchers should seek to address.

Finally, our study can be used to guide a variety of practitioners on the ground, primarily leaders of traditional, F2F teams that transitioned into VT e-leaders without the necessary preparations or relevant

training, as well as professional bodies, such as the CIPD in the UK and HR and other professionals who should adjust their policies in line with the requirements of the Covid-19 VT context. Given the multidisciplinary impact of our study, we offer a set of practical implications and actionable examples:

First, starting with a general observation, new e-leaders should look at the bigger picture and avoid creating replicas of older practices which may not apply to the (post-) Covid-19 VT context; instead, they should be open to alternative e-leadership styles (e.g., emergent and varying types of shared leadership) that could be more suitable and work better for all. For example, a two-hour F2F meeting cannot be replicated as a two-hour virtual meeting as this is likely to lead to fatigue in the Covid-19 VT environment. Indeed, as Davison (2020) argues, there is a case for reducing the number and length of meetings post-Covid-19, rather than simply replicating the pre-Covid-19 world.

Second, following our first theme on looking after VT members' digital well-being, e-leaders should help their VT members select the right ICTs for the tasks at hand. They should also consider that, in the Covid-19 VT context, there could be more (invisible/unrecognised) demands for VT members, but no more resources. Not paying attention to such issues might lead to challenges, such as fatigue, technostress and ultimately burnout. To avoid such issues, e-leaders should recognise the demands characterising the Covid-19 VT environment and ensure their VTs have the necessary resources, which could differ from those in the F2F team environment. For instance, VT members need access to fast and reliable Internet connections. This may be hard to achieve when a single home Internet connection is used by multiple members of the same family, adults and children, all living and working/studying at home. e-Leaders may need to consider providing separate Internet access for their VT members to ensure that they can work productively.

Third, fostering engagement in VTs is more challenging due to the discontinuities characterising virtual work. e-Leaders should identify ways to foster VT member engagement on a constant basis, and not as a one-off activity, and they should strive to cultivate a culture of trust and relationship (and guanxi) development, building on existing strengths of the Covid-19 VT context. For instance, in Covid-19 VTs a social context pre-exists given that these teams were previously physically collocated teams whose members interacted regularly in a F2F environment and thus have established social relationships with one another. e-Leaders should therefore find ways to *maintain*, rather than create anew, a social context within the Covid-19 VT environment.

Fourth, the Covid-19 working environment is highly blurred with the workers' personal/family environment, rendering work-life boundaries more permeable. In particular, traditional types of boundaries (e.g., spatial, temporal) have largely vanished. e-Leaders should make sure that their VT members adopt a boundary management approach that suits themselves. For example, those who prefer to keep things separate (i.e., segmenters) could (re)create spatial or temporal boundaries within their home environment, if working from home, by designating a specific space for work or a specific timeframe outside which work is not allowed.

Lastly, one of the benefits of virtual work is its increased potential for creative performance and innovation. Using the affordances of different ICTs, e-leaders should use the technological capabilities of ICTs with different synchronicities to support and encourage creativity and idea generation (e.g., synchronous sessions for brainstorming at the team level). Likewise, virtual work is about new types of arrangements and collaboration across boundaries, as it is the case with Industry-Academia collaborations, which could be the right environments for creative and innovative outputs. To maximise the creative potential of their VTs, e-leaders should use the characteristics of their own VTs (e.g., types of ICTs used, task at hand) and capitalise on the cross-boundary opportunities that VTs afford to ensure the necessary factors enabling creativity are in place (e.g., supportive leadership, diversity).

Appendix

Table A1
Criteria and examples of literature search.

Field of study	Source	Example journals ^a	Example papers	Topic
IS/ IM	Peer-reviewed journals	<ul style="list-style-type: none"> Information Systems Journal Information Technology & People International Journal of Information Management 	(e.g., Asatiani et al., 2021; Chamakiotis et al., 2020; Panteli et al., 2019)	<ul style="list-style-type: none"> VTs, GVTs, Virtual Project Teams (VPTs) e-leadership styles, practices, behaviour and challenges Covid-19
Management (including HR) and Leadership		<ul style="list-style-type: none"> International Journal of Human Resource Management Journal of Management The Leadership Quarterly 	(e.g., Bailey & Breslin, 2021; Gilson et al., 2015; Larson & DeChurch, 2020)	
Organisation Studies and Organisational Behaviour/ Psychology		<ul style="list-style-type: none"> European Journal of Work and Organizational Psychology New Technology, Work and Employment Organizational Dynamics 	(e.g., Chamakiotis & Panteli, 2017; Crisp & Jarvenpaa, 2013; Gibbs et al., 2021)	
Other	<ul style="list-style-type: none"> Industry reports Professional/ popular press 	<ul style="list-style-type: none"> LSE Business Review The Wall Street Journal The Guardian 	(e.g., Deloitte, 2020; London Chamber of Commerce and Industry, 2020)	<ul style="list-style-type: none"> Virtual/ remote working Work practices in the Covid-19 context

^a Note, we searched for papers in relevant journals across the fields outlined in the left column and we reviewed 80 journal papers (all included in the reference list of our paper). The journals and papers listed in this table are not intended to be more than a representative sample.

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