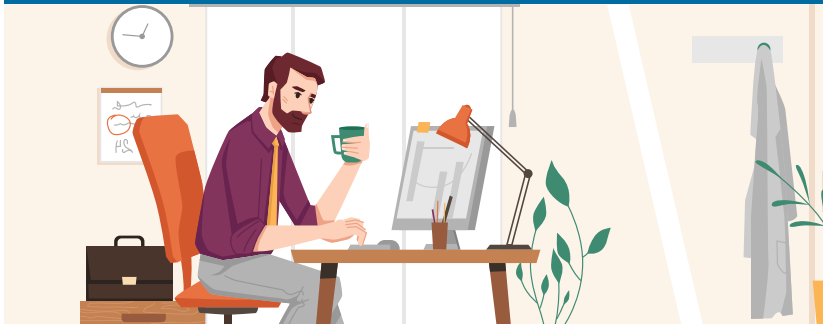# The Remote Working Genie Is Out of the Office Bottle

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// To be effective and sustainable, postpandemic remote working will require a deep rethink of fundamental practice. This article provides signposts to aid in the journey from coping with remote working to thriving in remote working contexts. //

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CATALYZED BY AN enforced response to the COVID-19 pandemic, the remote working genie has emerged with great gusto from the office bottle. And there is no evidence that the genie desires a full-time return to the comfortable surrounds of its former bottle. In dealing with the natural world in which we exist, a key element generally revolves around recognizing changes and adapting to them. This adaptive capability is robustly postulated as the primary measure of evolutionary success,[1] and it has been examined in the context of business performance in software development firms.[2] Some of the stress that is felt at present is not just pandemic anxiety, it is the pain associated with change and adaptation. We are changing the way we work while keeping firms running, and this is never a simple task.

Software firms have long been toiling with the challenge of globally distributed workforces, and significant innovation has been deployed in response to those challenges in recent decades. But in many cases, the global workforce was structured around centralized national and regional office hubs. Looking more closely at the disruption of decentralized home office-based remote working, we find a different cocktail of complex and interrelated factors. Understanding these factors is central to addressing the challenge of remote work and to unlocking its opportunities.

The extent of the responsive practice adaptation might surprise, and even alarm, some stakeholders, but it is essential that it be clarified. More importantly, firms and employees that fail to fully appreciate the implications of the ongoing transition to partial or largely remote working models risk damaging their organizational and individual objectives. It seems foolhardy to suggest that once the pandemic had completely passed, working arrangements would have returned wholesale to pre-COVID-19 norms. Our task, therefore, is to design adapted modes of work that crystalize around the vision of a future in which remote working is a fully integrated business process.

This article seeks to illuminate the major concerns and suggest possible mechanisms to deal with them. It is not a complete work; the remote working debate is simply too broad and complex for it to be so. But it is essential to progress the debate regarding this important new aspect of work, and it is hoped that the identification of principles to enable effective remote work will prove useful to

firms and their employees. Remote working disruption is not just a challenge for software firms, and therefore, many of these principles will have further reach (but they are presented with a specific focus on software engineering workplaces).

Remote Working Principles

In any professional relationship, general principles surrounding expectations are helpful to support the smooth operation of the engagement. In a traditional office context, daily attendance and casual intermittent observation provide powerful means to evaluate work commitment. When employees are based remotely, opportunities for directly gauging commitment may be largely removed. Indeed, the very concept of work engagement itself changes; it may become more punctuated by one's personal life. But the work still needs to be completed. The challenge is to pivot to a set of practices that enable work completion as smoothly as possible for firms and their employees. Figure 1 identifies some of the pros and cons associated with remote working along with six remote working principles that can be applied to help guide remote working arrangements.

Principle 1: Be Remote but Local

It is tempting for some to envision future working arrangements where one can secure a Bay Area salary but surf the west-of-Ireland Atlantic waves, all the while living a life of relative local luxury arising from cost-of-living differentials, but there are several practical constraints that work against this arrangement. First, there is the time difference: few wish to be nighttime workers! In winter time, when it is midafternoon in California, it is approaching midnight in western Europe. Ultimately, and even if they are remote, development teams benefit enormously from working in the same time window.

Queries to remote colleagues can be asynchronous, but having to wait until the next day on some blocking piece of information is just not economically attractive, and it frustrates knowledge workers and the creative process. There are many instances where these exchanges are desirable: walk the floor of any software business and you will see developers regularly chat to colleagues, even if only very briefly, for some critical insight. The value of these exchanges has not been commented on to any great extent and, as phenomena, is perhaps not well understood. But these interactions happen all the time, and practically speaking, for most humans, they can do so only in well-aligned time windows.

Software development is an intensively human-led activity, and social ties and experiences are key to our sense of belonging. While long-term long-distance relationships can work for some people, they seem
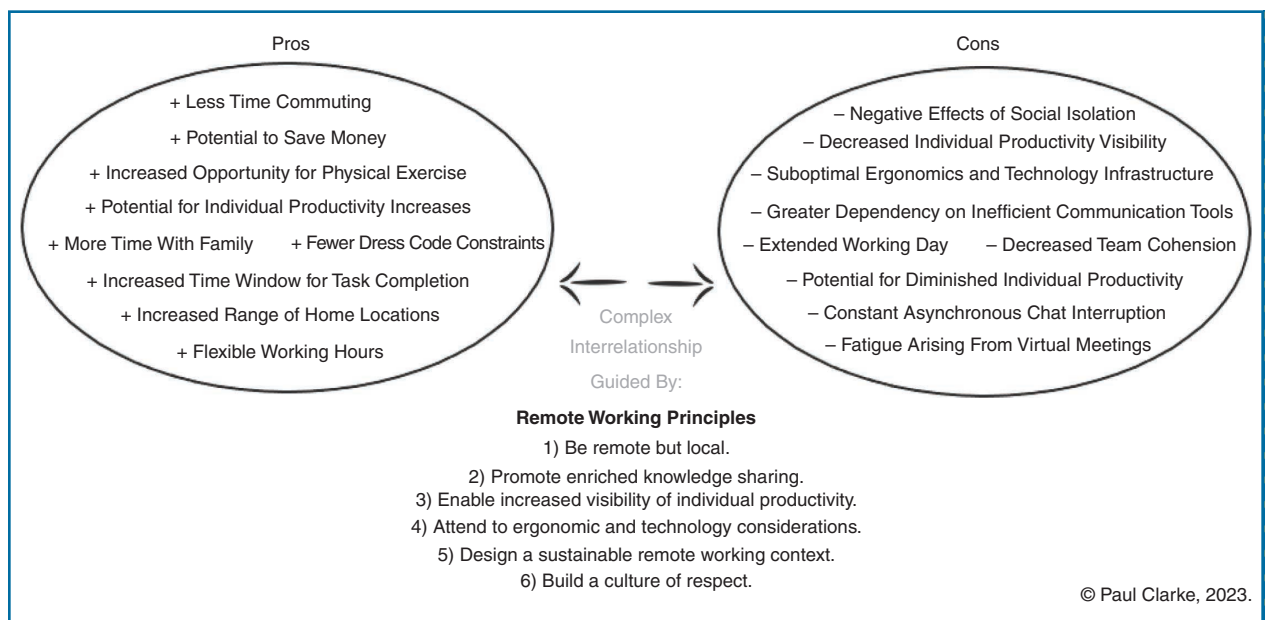
FIGURE 1. The remote working principles and sample remote working pros and cons.

inoperable for most people most of the time. The reasons accounting for this reality lie well beyond the scope of this article, but the import for software developers and software firms is that some degree of regular in-person social engagement is likely to be integral to employer and employee welfare. This means that even if employees are based remotely, it is in everyone's long-term interest that teams meet up in person on a regular basis. This could be aligned with certain sprint planning meetings and with sprint retrospectives (and at other times altogether).

Whatever the case concerning the timing of meetups, alignment with a work-related event seems sensible, and attendance should be viewed as highly desirable. In a predominately remote working paradigm, a firm might largely dispense of expensive office space, but in so doing, it should not socially isolate its workforce. Regular in-person meetups are essential to human bonds, even if we do not fully appreciate why this is the case. A company might choose different locations for meetups, social events that employees can vote for, and locations that are convenient to work force location. Activity, entertainment, and fun should be facilitated: one can imagine a new business line for companies offering services to software firms that want to have high-quality time together for employees.

Aside from the benefits of meeting in person and the clear advantages to being in aligned time windows, with rising concerns in relation to atmospheric pollution and associated climate impacts, what company can defend a strategy of flying employees across vast distances on a regular basis so that they can socialize? The headwind facing long-term long-distance workforces would appear to be significant and perhaps also rising. This does not mean that companies cannot have a global presence and a global workforce; it means only that members of any single remote working team should probably be in more or less the same time zone. It is therefore not so much a case of advocating long-distance and entirely remote working; it is largely about recognizing that within individual teams, a strategy of being not too far away and having regular meaningful in-person meetups (perhaps happening at least once a quarter) is likely to be much more effective over time. And the *over time* aspect is critically important: What software firm can build its brand and market value with a highly decoupled, dispersed, and transient work force? There may be exceptions where this is possible, but in the main, it seems largely unachievable.

Principle 2: Promote Enriched Knowledge Sharing

The essence of this principle revolves around generating a sense of a shared experience through knowledge exchange, achieved through relating the ongoing individual experience (for example, of feature implementation). Generating a shared experience is critical on many fronts, and it is suited to building team morale. In a traditional office, this may be achieved through informal chats at someone's desk, at lunch, and over coffee (in some cases, more explicitly managed through explicit design and training). This sharing of experience helps to create a fertile learning environment, leading to a learning organization.

Among the primary intentions of practices and activities designed for remote working ought to be knowledge sharing, increased team communication and cohesion, and collaborative education. On the dark side of that intention, we find objectives such as harnessing peer pressure, to build and deliver high-quality work products in line with company standards and shutting down opportunities for less-than-high-integrity employees to stray from productive team objectives. Ultimately, this will be in everyone's interest. Employees learn and grow on the job, something that productive staff will enjoy and that presents with excellent onboarding infrastructure for new hires. Employers get a greater sense for productivity, company standards are continuously applied, and opportunities for reuse and refactoring are always to the fore. Furthermore, knowledge is distributed across various team members, which offers greatly improved resilience against natural employee attrition. Each of these positive outcomes is of critical importance to making remote working work for all stakeholders.

A team culture should encourage honest and positive self- and team appraisal. Sharing one's experience should be a positive experience. The most effective teams will not tolerate negative criticism and targeted discrimination. As Stephen Covey might advocate, the team will "seek first to understand" the contributions and challenges of team colleagues.[3] In human relations, we need to police the emergence of disharmony, and in software development settings, mechanisms for knowledge exchange are critically important. Somehow, the separate worlds of practices and cultures need to be carefully integrated. This could be addressed in many ways; it could be through more discussion around

user stories and implementation decisions (either virtually or in person).

Principle 3: Enable Increased Visibility of Individual Productivity

Metrics can be the source of acrimony, and when it comes to software development, they demand careful interpretation. People may not like being measured, especially in situations where measures might be misused and affect their work in a negative way. It is, furthermore, very challenging to measure performance in the software sector, where key considerations, such as individual productivity, have proved elusive to hard measurement.[4] It is only with time, and the evidence it yields, that we start to get a fuller sense for the maintainability and core quality of an individual's work products. The challenges of productivity and quality measurement must be tackled with renewed vigor in a remote working context. For the committed and honest employee, even one of just modest ability, this should not be feared, as it can demonstrate contribution and effectiveness.

Clearly, however, firms should also take steps to avoid using an individual's measurements as aggressive productivity levers. The emphasis should be on reliable and consistent measurement and on using these measures to raise the veil on purported productivity while fostering the growth of individual talent in complex technical projects. No one was born with all knowledge of all things, and knowledge of detailed engineering work takes time to accumulate.

Many in the software field will have witnessed the rise of the key technical expert in a group, sometimes warranted and with overall positive affect and at other times with disastrous consequences for all involved. One dominant personality might reduce the productivity of 10 aligned colleagues, with negative outcomes for product quality and team momentum. Bringing greater clarity to actual contribution on a regular basis will serve as an excellent reference point for all team members. As a principle, therefore, we should actively seek to enable greater visibility of individual productivity. This visualization will sustain individual work engagement, and if integrated into regular team events, such as daily meetings, it can also positively affect group knowledge sharing.

While these clear benefits can be envisioned, it is critical that the deployment of improved productivity visibility must not necessitate substantial additional effort for knowledge workers. Situations where workers are dedicating time to perfecting reporting metrics are not desirable, as this would inhibit the very productivity that the measures seek to demonstrate. Ideally, therefore, the metrics should be largely automatically generated, perhaps, for example, from commit logs, and individuals should self-report their metrics alongside the descriptive work update that is advocated in principle 2. The metrics essentially require a concurrent descriptive update to avoid interpretation errors. And to reiterate: great care is required in discharging the measurement regime; it must not be allowed to become a vehicle for intimidation and upset in the workplace. Apart from the fact that this would be a horrible experience for affected individuals, it would be likely to give rise to reduced productivity over time and, ultimately, to employee departures.

Principle 4: Attend to Ergonomic and Technology Considerations

It is unadvisable to underestimate the productivity impacts of suboptimal working spaces; hence, firms and researchers have spent decades and large sums of money attempting to address this concern. For firms, this might sound like a cost that they would rather not incur and understandably so, as those counting financial costs may have little knowledge of the creative and engineering processes associated with software engineering. Many factors converge here: the ergonomics of a comfortable chair and desk, the air and light quality in the room, the speed of the Internet connection, and the number and quality of monitors. While some will have the privilege of dedicated and well-provisioned home offices, this is not universally the case.

Graduate software professionals might find themselves still living with parents and working from the confines of a cramped bedroom that was never intended to be a work space. Indeed, in younger demographics, it might be that for some individuals, the benefits of attending a well-provisioned centralized office may be desirable as they embark on their career and independent life. These and other groups may prefer to attend the office on a daily basis, and acknowledging this reality serves as a justification for sustaining centralized office work space (even if it is scaled back). For those who are largely based remotely, firms need to assess their working environment. Working at the kitchen table or while reclined on a sofa is not likely to support productivity objectives (neither are they sustainable for individuals over long time frames). For employees who have a spare room or dedicated

space in their living accommodation, these should be provisioned at levels comparable to the centralized office, and it might be advisable for employers to insist on this and to fund it.

There is little sense to employing a highly paid knowledge worker and not also ensuring that the workplace provision is optimized for comfort and productivity. Just as employers have often engaged ergonomic expertise to design office space, perhaps companies can offer to deploy their ergonomics assessors to the task of improving home-based work spaces. Employees also have responsibilities, notably, that if they cannot demonstrate that they have a viable and sustainable remote working environment, then firms might sensibly and defensibly reduce and remove remote working opportunities.

Asynchronous work has been enabled through many different technology innovations. Rather than using static documents and spreadsheets that are shared via e-mail attachments, the use of shared virtual copies of these artifacts should be promoted. Here, Google Docs and similar applications could be very useful. The challenges of the configuration management of various software artifacts clearly demand very close attention. Thankfully, innovations, such as GitHub, greatly improve the velocity and traceability of changes, and the advent of commit hooks helps to raise the speed and consistency of the integration process. Policies around integration sizes, for example, for new code additions/code changes, might need to be revisited in some settings; the general position in agile software development is that lengthy periods between code commits tends to be discouraged. The basic point of principle 4 is that technology enablers should be in place alongside ergonomic considerations.

> There is little sense to employing a highly paid knowledge worker and not also ensuring that the workplace provision is optimized for comfort and productivity.

Principle 5: Design a Sustainable Remote Working Context

In some agile methods, we have seen the inclusion of a sustainable working week aspiration, reflecting the fact that if knowledge workers (indeed, all workers) are continuously overstretched, they will ultimately burn out. In this respect, working remotely, liberated from the stress of commuting and direct pressure from managers and peers, may well present as an attractive proposition to many. But the unavoidable truth is that the stress and pressure of workplaces exist, in part, because of the need for productive competitive advantages. A conclusion from this observation is that productivity demands must remain at similar levels if working remotely, and therefore, work products will not be fewer in number, and reduced quality and timeliness in their delivery will not be acceptable.

Remote workers must therefore ask essential questions of themselves: If I decide to spend two hours every morning on personal leisure pursuits, am I also prepared to work evenings and nights (and perhaps also weekends) to make up the difference? And if I end up working nights, is that a sustainable working arrangement for me, or does it affect sleep quality? How are others in my household affected by my remote working? Are family relations improved or eroded while remote working? Is the transformation from home to home office imposing unwelcome constraints on other home dwellers (e.g., children)? Although of a personal nature, these questions are as essential to the viability of remote working as any other element of the debate. Individuals need to carefully consider the impact of remote working and its sustainability in the context of home working arrangements and take steps to design new work habits that take advantage of remote working while not diminishing work quality and productivity.

Dealing with this particular challenge is certainly not trivial, and the burden of responsibility perhaps falls on the individual remote worker. The employer, however, in many jurisdictions, cannot divorce itself from liability in terms of overworking and unfairly treating its workforce. It seems, therefore, that some mechanism for tracking hours worked might, in some cases, be helpful for both the worker and the employer. This could be an

unwelcome and unnecessary suggestion for many mature, trustworthy, and responsible workers, and perhaps the precepts advocated in principles 2 and 3 will adequately, and more appropriately, deal with sustainable remoteness for both parties.

Humans are a social species, accustomed to regular in-person interaction. The removal of office-based social interaction opportunities not only introduces risks for knowledge exchange but it is also reported to carry risks in relation to well-being,[5] a factor that is associated with productivity in software engineering settings.[6] A sense of loneliness can mount if detached from colleagues and friends, with negative impacts on individual happiness. Most of the workforce may have no experience of such isolation. Even in the COVID-19 era, those subjected to lockdown were often locked down at home with other family members, for example, children whose education was moved online. Beyond the pandemic, the full effects of long-term remote working in an empty house are not well understood. There are clear differences also in the separation of work and nonwork life activities. Whereas, traditionally, work ended upon walking out of an office building, with remote working one's work is constantly accessible. For particularly conscientious workers, this could increase work engagement to levels that may not support long term well-being.

Principle 6: Build a Culture of Respect

Being a remote worker should not be confused with being an independent worker. Some individuals will inevitably drift into embracing the freedom of unsupervised work, at a cost to their peers and employer. Signs of such drift might be evidenced as having only very limited time availability for meetings with colleagues, slow responses to queries from colleagues, being late for virtual team engagements or not being truly present in the meetings, and tending toward nonattendance at regular in-person meetups. It is not to suggest that remote workers respond instantly to each and every request (incessant interruption can reduce productivity), but a brief response that a colleague awaits might slow, and even completely stall, progress on an important issue.

It seems sensible to establish different channels for team and individual communication. One set of channels could be reserved for blocking low–interruptive requests, with other channels for nonblocking requests. Requests to channels should be profiled, not necessarily in an individual sense but at a team level, to understand whether a healthy level of team communicative noise is in evidence. Too little noise might indicate that some team members (especially new hires) are languishing in a sphere of reduced productivity; too much noise and team productivity may be damaged. There is no known quantum for healthy levels of interruptive communication in software development teams, and evaluating these types of data will need to be subject to the careful interpretation of the experienced eye.

Team members should not be afraid to attempt brief impromptu virtual calls with colleagues to request information of a blocking nature. It might be advisable to tend toward voice and video communications in preference to lengthy e-mails and strewn out asynchronous chat relay dialogues. As humans, we are biologically fine-tuned for in-person face-to-face verbal communications, while in comparison, typing and reading may be productivity inhibitors. Long chains of e-mails and blame trails are not useful in a team that seeks to optimize its collective efforts. This is one of the fundamentally more challenging aspects of remote working.

Some long-established conventions can likely assist, such as being on time for virtual meetings. Other aspects will require greater reflection. For example, while having a camera on can be helpful for the human experience at some points, it has also been highlighted that contemporary videoconferencing technologies can lead to fatigue[7] and may adversely affect certain demographics, especially women and newcomers.[8] This is one of those situations where individual context is critical to fine-tuning the approach, and one suspects that the duration spent in virtual meetings should be carefully calibrated for overall productivity.

It may transpire that remote working demands dedicated time slots where interruption is encouraged. Ironically, this is the opposite to the noninterruption periods that were once applied in software engineering offices (in recognition that excessive interruption is costly in software development settings). A perhaps simple starting point might involve all team members being available in a certain daily window for interaction and real-time communication. But much more thought will be required to define remote working communication mechanisms and to ensuring that they are appropriate to sustainable long-term productive outcomes.

Discussion and Future Work

It is one thing to identify principles in the abstract; applying them in practice is where so much experience and interpretation are required. For this reason, some sample applications are provided in Table 1. In agile settings, extensions to Scrum ceremonies can be envisioned. Stand-ups could be extended in duration, and greater planning and implementation detail could be provided by participants. Screen sharing actual code (and other artefacts) that has been implemented and whiteboarding user stories could help to reduce the effects of lost communication opportunities. To those who might be concerned that longer virtual stand-ups and more time spent on user stories is needless expense, recall that although not costed, almost constant daily interaction is pervasive in centralized software development offices. The work to reimagine development practices has commenced in many settings, but it is far from finished.

Remote working has proved to be a peculiar guest for many practitioners: welcome at first, perhaps still welcome, but it is a visitor that has become resident. Much changes when residency sets in.

These are challenging times, but they are also exciting times. Just when software firms had so much sorted, the response to a global pandemic wedged a foot in the doorway leading to remote working. A not insignificant proportion of employees do not want to go to the centralized office every day, nor, it seems, do they need to! Employees have many reasons not to attend the office in a traditional working arrangement: avoiding commuting and the environmental damage it inflicts, putting that robust software industry salary to good effect in a larger and more comfortable home outside the dense urban space, spending more time with family, freedom from the shackles of the nine-to-five drudge. But this is just one perspective.

Some developers do not wish to uproot and move to the wilderness to raise their children; perhaps they prefer cities anyway, and maybe the social rewards of daily attendance at the workplace are worth the toil of getting there. For some employees living close to their office, there may be no great amount of commuting effort involved. Much of this is poorly understood at present, and it is complicated. But amid the complication of and many dimensions to the remote working debate, the fact is that working from home can be done and done well. We have witnessed that fact these past three years. Moving forward, and no matter what, some software personnel will elect to work largely or partially remotely, and employers will facilitate that to attract and retain talent that continues to be in short supply.

Future research should seek to clarify the benefits and limitations of remote working and how these relate to personal preferences. It might be that a firm's employee demographic is a major factor affecting remote working suitability. The culture of the organization might also strongly influence the desire to be integrated in highly cohesive teams, which may demand more frequent in-person engagement. For some individuals, attending a centralized office might be a strong preference. One further key area for future research regards the types of policies that firms need to establish in remote working contexts. Finally, the importance of remote working provisions in potential employer selection should receive research attention. While it might seem that we are well established in remote working, a more realistic assessment might assert that we are exiting a pandemic and only just at the start of the sustainable remote working era.

Table 1. Remote working principles and sample applications.

Principle	Sample application
Be remote but local.	Avoid long-distance teams/time zones.
Promote enriched knowledge sharing.	Focus on voice and video communication over textual exchanges.
Enable increased visibility of individual productivity.	Present individual work at virtual meetings.
Attend to ergonomic and technology considerations.	Treat home office infrastructure with the same importance as a centralized office.
Design a sustainable remote working context.	Integrate team and individual well-being into regular in-person meetups.
Build a culture of respect.	Establish communication policies that reduce constant interruption and facilitate high-priority requests.

Out of the ashes of the pandemic response will rise innovative new techniques to integrate remote working as a regularized business process for employers and employees alike. Having remote working principles helps to clarify our strategy when designing effective and sustainable remote working practices. Six principles for remote work have been suggested in this article:

1. Be remote but local.
2. Promote enriched knowledge sharing.
3. Enable increased visibility of individual productivity.
4. Attend to ergonomic and technology considerations.
5. Design a sustainable remote working context.
6. Build a culture of respect.

Pivoting to a partly or largely remote working paradigm is beset with risk: it is potentially destabilizing for work and home environments. Upon initial reflection, remote working might appear highly desirable to staff and a source of distress for employers. Deeper examination exposes the complexity of the debate; it confirms that remote working is not necessarily the great boon that some staff might instinctively sense. And for firms, the fact that remote working has been made to work for the extended period of the COVID-19 pandemic shows that absolute resistance to the concept is unwarranted.

The remote working genie is out of the office bottle, and we must now find ways to optimize our new reality. The frustrating thing about genies is that although they bestow unbounded wishes, we seem destined to struggle to take full advantage of their powers. Sustainably integrating some form of remote working in software engineering firms will be a struggle, but if achieved, it can deliver powerful benefits for firms and their workforces. 🕸

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