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**Article**

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# COVID-19, smart work, and collaborative space: A crisis-opportunity perspective

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## ABSTRACT

In this essay, I employ a crisis-opportunity perspective to approach the practice of smart work and the making of collaborative space in responding and adapting to COVID-19. These trends have been emerging at a faster pace in the recent decade, facilitated by a growing knowledge economy and information technological advancement. COVID-19 provides an extreme setting to test and trigger changes, and are likely to translate these emerging trends into a new normal in the way we work and the way we use space. This new normal, once established in the post-CVOID-19 world, will necessitate a new thinking about workplace management and space design to disrupt many norms rooted in an industrial age.

## Introduction

The history of human evolution and civilisation is one of confronting and surviving crisis, successfully. Crisis—natural or human—causes damages and casualties; crisis also propels changes and reforms that translate into opportunities. A crisis-opportunity dialectic is sometimes attributed, mistakenly, to the ancient Eastern philosophy. For example, the Chinese word ‘crisis’ comprises two characters meaning ‘danger’ and ‘opportunity’ respectively. Similar thinking is also evident in the Western wisdom, as reflected in sayings like ‘every cloud has a silver lining’. Many great inventions in our social systems and technologies have been triggered by our responses to crisis. This crisis-opportunity thinking can be applied to approaching the COVID-19 pandemic too. COVID-19 presents an extreme circumstance under which we have to experiment with certain practices and ideas that could not be possible otherwise, and we have to revisit some old practices to inform a reformist thinking about the post-COVID-19 world.

In this essay, I employ a crisis-opportunity perspective to examine the disruptions in the way we work and the way use space in COVID-19. Based on this examination, I draw some reflections on the future opportunities of practising smart work and creating collaborative space in the post-COVID-19 era. This essay is organised as follows. In next section, I outline several megatrends of economy and technology, which contextualise this essay's concern on the crisis-opportunity of smart work and collaborative space in COVID-19. In the third section, I compare my personal experiences in SARS 2003 and COVID-19—17 years apart—to reveal several economic and technological differences that have shaped the different ways the two crises were perceived and responded to. In the fourth section, I examine smart work in normal and crisis scenarios respectively, based on a survey before COVID-19 and personal experiences and observations in COVID-19. In the last section, I conclude with some reflections on a new normal of smart work and collaborative space, possibly as a sort of opportunity deriving from the COVID-19 crisis.

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## Emerging trends

I use an endogenous-exogenous framework to underpin the propositions for transformative smart work and space in COVID-19. Certain endogenous trend follows its own evolutionary logic and trajectory. During its evolution, this trend encounters an exogenous crisis, in the forms of intervention, shock, or disruption that is external to the endogenous trend. As a result, the endogenous trend has to respond and adapt to the exogenous crisis, a process that may have a tendency of generating innovation. This innovation, once established after being tested and widely applied, will forge a new paradigm and become a new normal. In understanding and applying this framework, it is important to note the underlying endogenous-exogenous relationship: the endogenous trend may evolve into a paradigm shift in due course by itself; the exogenous crisis functions as a triggering factor or an enabler that intervenes into the evolution and expedites the shift, which would otherwise take longer time or might even follow a different trajectory.

Several megatrends are evolving and influencing the way we work, and the way we use space. Of them, the rise of the knowledge economy and the advancement of information technology, two mutually reinforcing forces in a post-industrial era, are disrupting many norms established in an industrial era (Hu, 2019). Accelerated evolutions of them are heightening the degree of the disruption exerted by them. Here I highlight the distinct attributes reflective of the latest developments of them: the knowledge economy is digital, innovative, and collaborative; the new technology is interconnected, ubiquitous, and synchronous. These attributes are enabling smart work—working anywhere and anytime (Hu, 2019). Smart work is not new. Its early form of telework dates back to the 1970s (Nilles, 1975), and debates about its pros and cons and efforts to practise it have experienced booms and busts. The recent surge of interest in smart work has directly resulted from the latest technological advancement and a growing dominance of the knowledge economy.

Access to interconnected, ubiquitous, and synchronous information is revolutionising the work for the knowledge economy that is digital, innovative, and collaborative. The capability of working anywhere and anytime is disrupting our perceptions and practices of space uses and regulations—legacies of an industrial era—and calls for new spatial cognition that is post-industrial and post-functional. Spatially-based urban functions are blurred or co-exist, and new functions and spaces are created (Marino & Lapintie, 2017). These trends of work and space, in terms of both perception and practice, are emerging. Attitudes towards smart work are mixed: there are advocacy and resistance; there are certainty and uncertainty. But a general positive belief in its future is growing, and more pilot practices have been undertaken in both private sector and public sector.

COVID-19 imposes a compulsory practice of smart work, regardless of any prior acceptance or rejection of it. This crisis is a test to the adaptability and resilience of smart work in addressing an external shock. This crisis is also triggering an opportunity of revisiting our perception and practice of smart work and its viability in the long run. It further presents an opportunity to critically reflect on the conventional space use and design that is based on an industrial, functional thinking.

## SARS vs. COVID-19

I compare my personal experiences in SARS 2003 and COVID-19 to seek the differences with regards to work, technology, impacts of crisis, and adaptability to crisis (Table 1). In early 2003, I lived in Beijing, a hotspot of SARS. It seems that SARS was more fatal but less infectious than COVID-19. Beijing was not locked down during the SARS period in the same way as Wuhan and many other cities during COVID-19. I was a business manager of property development in Beijing; the nature of my work then was knowledge intensive, to a lower degree than my current academic work although. Technological readiness was far less sophisticated than today: not every household in Beijing had internet connection. I established internet connection at my home during SARS, when I had to spend more time staying home, not for work purpose but simply for entertainment. Smart work was an alien concept and practice, although it was possible to request working from home on an occasional basis, for example, to concentrate on writing up a business report. I never made such a request, however. The disruption of SARS to my work was very high. The office was closed—a corporate decision—and the work totally paused. Overall, the adaptability to the SARS crisis was at a low level, in terms of technological readiness and smart work.

When COVID-19 became a global pandemic in 2020 I live and work in Canberra, a contrast to Beijing in city scale and structure. I am an academic—a knowledge intensive job for disseminating and creating knowledge. Information technology permeates our work and life in an unprecedented manner, and smart work, a buzzword of debates and advocacy, is a growing practice in many knowledge sectors. The university campus where I work was closed in the middle of semester. The teaching was moved completely online within one week, technically and logistically, although the teaching and learning experiences and pedagogical implications await to be reviewed and reflected on. The majority of other university businesses were also moved online, in a reasonably smooth manner.

**Table 1**  
SARS and COVID-19 in comparison.

	SARS	COVID-19
Cities	Beijing	Canberra
Knowledge intensiveness of work	Lower	Higher
Technological readiness	Lower	Higher
Acceptance and practice of smart work	Lower	Higher
Disruption of work	Higher	Lower
Adaptability to crisis	Lower	Higher

COVID-19 impacted the arrival and recruitment of international students, and put most Australian universities, which heavily rely on international students for income, in a financially difficult situation. But the disruption of work seemed to be tackled reasonably well, in great part thanks to technological readiness and the knowledge intensive nature of university business. Compared to my experiences in SARS 2003, so far, the overall adaptability to COVID-19 is at a much higher level. However, SARS lasted for several months only. The world is still in the mid of combating COVID, with great uncertainty and challenge ahead in months or even years to come. So, this comparison between SARS and COVID-19 is personal, experiential, and tentative.

### Smart work in normal and crisis

Australia's capital city Canberra, where I live and work, provides an interesting setting to test some propositions for smart work. According to Australian Census 2016, the city had a resident population of 396,857 and an employed workforce of 215,588 (ABS, 2016). Within the national urban system, Canberra is smaller than those state capitals such as Sydney, Melbourne, Melbourne, Perth, and Adelaide. Despite being a small city in size, Canberra boasts of being a knowledge city: it ranks after Sydney and Melbourne only in a knowledge city index that measures the knowledge capital and knowledge economy of all Australian cities—large and small (Pratchett, Hu, Walsh, & Tuli, 2017). Among the major Australian cities, Canberra's economic base is the most knowledge intensive and its workforce has the highest levels of education and income on average: these economic and human capitals make the core of the city's competitiveness (Hu, 2015). In recent years, smart work or similar flexible work modes have attracted growing attention in the city, and many pilot programs have been in place. While the private sector is quicker and readier to embrace smart work like elsewhere, the public sector is slower and more hesitant. Smart work is especially a debatable issue in Canberra, caught between the city's role as the seat of government and an imperative to diversify the local economic base and capitalise on the opportunities of a digital economy (Blakely & Hu, 2019).

I undertook an online survey to investigate the practice and perception of smart work in Canberra in 2016, through the Australian Capital Territory government. This survey received 300 responses in total. As many as responses were solicited through recurring emails and networks, at a cost of calculating accurate response rate. I present the breakdowns of perceived benefits and barriers of smart work (Figs. 1 and 2). The choices of these benefits and barriers were developed through a focus group within an Australian government department. For these reasons, the survey design and results are more reflective of Canberra's normal as a government city. A broader nationwide backdrop is that participation in smart work in the public sector is lower than the national average as well as the private sector (Blakely & Hu, 2019). In the knowledge city index for Australian cities, Canberra performs at a lower level than the national average in smart work only, as a result of the high presence of public sector in the city (Pratchett et al., 2017). These backdrops underline the survey results.

In terms of benefits of smart work, work-life balance and increased productivity are top two factors, far ahead of the other factors (Fig. 1). In terms of barriers of smart work, the top two factors are poor ICT infrastructure and resistance to change—one technological factor and one cultural/attitudinal factor respectively (Fig. 2). One survey question asked about the respondents' willingness to utilise smart work arrangement. Of the 300 respondents, 119 skipped this question, and 181 answered it: 118 indicated 'yes', 56 indicated 'not sure or maybe', and 7 indicated 'no'. Choices of 'not sure or maybe' and 'no' account for nearly 35 per cent of the responses to this question.

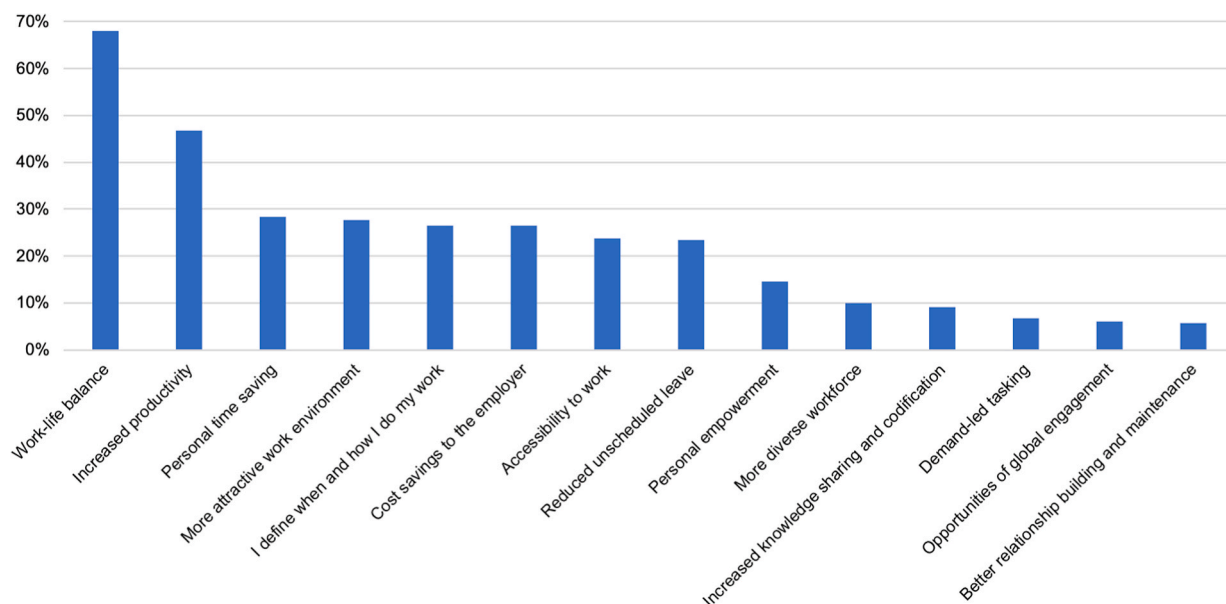


Fig. 1. Benefits of smart work (n = 282).

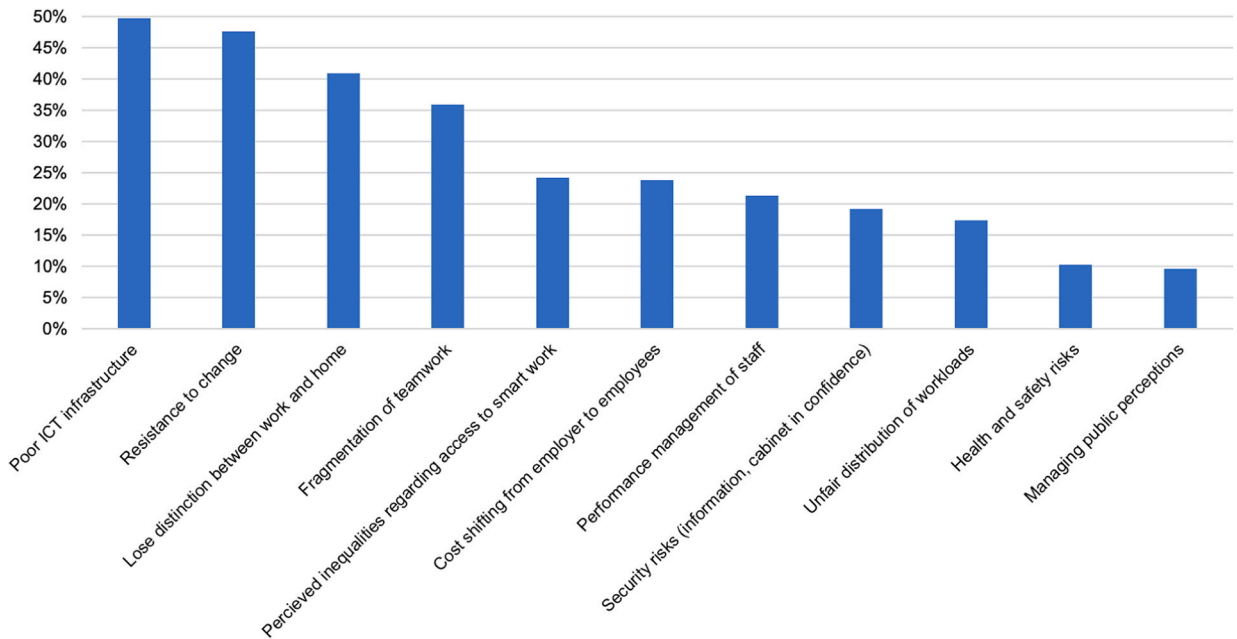


Fig. 2. Barriers of smart work (n = 281).

From these survey results, a major takeaway is the respondents' attitude towards smart work. Smart work is an emerging trend, and its benefits are clearly identified and appreciated. However, resistance to change is a major barrier for its acceptance and one third of respondents did not indicate an interest in it. This cultural/attitudinal factor has been one of the focal debates about smart work in Canberra, and probably elsewhere as well.

COVID-19 disrupts a normal of smart work with a crisis. I do not have a survey on the disruption of COVID-19 and have to rely on personal experiences and observations to comprehend it. The practice of smart work in COVID-19 is not new or disruptive by itself. But COVID-19 presents an exogenous shock, intervening into the smart work trend—an endogenous process in evolution—without any precaution or leeway for preparation. It renders smart work—working from home to be specific—the only alternative mode of work for knowledge workers with or without prior readiness or acceptance. A study during COVID-19 estimated that 39 per cent of all jobs in Australia can be done from home, and Canberra has the highest proportion of workforce for this 'teleworkability' (Ulubasoglu & Onder, 2020). COVID-19 removes *all* the barriers to smart work in normal to test its viability in crisis and expose its attributes in an extreme situation—a social experiment that could exist in theory only if it were not for COVID-19. In this sense, COVID-19 brings an opportunity—an unplanned, unwanted opportunity albeit—of expediting a test to the possibility and potential of smart work in the knowledge economy to inform post-COVID-19 implications.

The COVID-19 experiences bring to the fore the creation of two types of collaborative spaces through smart work: a virtual collaborative space and a physical collaborative space, which are interrelated and mutually enabling. We establish a virtual collaborative space not only to replace the normal workplace but also to expand a borderless realm with multi-scalar outreach—local, regional, and global—for knowledge-based activities. This mode of collaborative activity—working anywhere (at home in COVID-19) and collaborating electronically—presents a scenario of 'working alone together' (Spinuzzi, 2012), an oxymoron capturing this physical-virtual integration in facilitating collaboration. This essay is a product of an international webinar forum organised by this journal during COVID-19. This forum attracted a dozen of speakers and around 50 participants across the world—my first experience of its type and the largest audience that I ever witnessed at an international conference seminar. COVID-19 propelled me to become a fond user of those digital tools and has significantly enhanced my connectivity with people for work, no matter where they are, in frequencies that I could not imagine if it were not for COVID-19. Before COVID-19, I had nearly all the enabling factors for smart work but a push that I have to do it.

Smart work under COVID-19 also expedites a rethinking of physical collaborative space, ironically, in an environment of social or physical distancing. If we can work from home—or from anywhere as conceptualised for smart work, and the cultural/attitudinal resistance from both employers and employees is not a barrier—an idealised scenario as tested in COVID-19, we need to systemically revisit the way we plan and design space and the way we perceive space use in the post-COVID-19 world. An increasing spatial disruption, as a result of the sharing economy and digital revolutionisation, is already challenging the conventional land use and space use classification and coding systems established in industrial cities (Hu, 2019). In an age of the knowledge economy and new technology, collaboration defines both the virtual space and the physical space, and an integration of them. This collaborative nature of knowledge work is changing the nature of design to stimulate innovation (Wagner & Watch, 2017). Consequently, we have seen home office at home; we have also seen homey office in office; and we have also seen increasing work activities in those third spaces traditionally not for work. This practice is not fully exposed in COVID-19 given the restriction of staying home—on the contrary, it is

constrained. However, COVID-19 signifies the possibility of a spatial trend that may be accelerating in the post-COVID-19 era, exploring the potential of collaborative spaces through working anywhere for knowledge-based activities.

### Concluding reflections: towards a new normal?

I draw some reflections on smart work and collaborative space as possible opportunities triggered by the crisis of COVID-19, combining some observations during the pandemic and some imagination about the future. I argue that these evolving trends, after being expedited in the crisis, are likely to forge a new normal in the way we work and the way use space in the post-COVID-19 world.

Smart work is blurring the temporal and spatial divisions between work and life for knowledge workers. Its defining attribute of temporal-spatial flexibility, hinged on the nature of the knowledge economy and enabled by information technological advancement, challenges our conventional perception of time and space—a path dependence from an industrial age. History has shown a technological-cultural divide: in the progression of many inventions, technological advancement was leading, but people's acceptance was often lagging. COVID-19 is disrupting a resistance to the change of smart work through imposing an unusual circumstance under which it may work, or it must work. COVID-19 may last longer than anticipated or wished—its geography and duration already surpassed SARS 2003. It is likely to be long enough—an undesired scenario—not only to expedite a change, but also to establish, culturally, a path dependence on a COVID-19 normal in the post-COVID-19 world. This new normal will challenge the existing organisation and management norms and workplace culture, and demand reform and change.

Smart work is reinforcing the making of collaborative space in two senses. First, aligned to its defining attribute of temporal-spatial flexibility, smart work is disrupting the spatial divisions classified by codes of land uses and space uses. In doing so, smart work signals the coming of a smart design paradigm that incorporates this spatial disruption and creates collaborative space to enable innovative knowledge production. Second, this collaborative space further goes beyond a physical dimension and integrates both the 'space of flow' and the 'space of place', as proposed by Manuel Castells (2000) to capture the spatiality in a network society, in knowledge production, consumption, and sharing. A physical-virtual integration in space uses and knowledge activities informs a rethinking of many modernist norms in urban planning and development, including a binary of urban and suburban, separation of working and living, and infrastructure provisions associated with these spatial norms. This new normal will naturally establish a dialogue with the wicked problems of sustainability, climate change, and social inequality confronting contemporary cities, and may raise more questions than provide ready answers.

We are still in the middle of fighting COVID-19. Grave uncertainty and challenge lie ahead. We do not know yet when and how this crisis will end; it is a test to the collective intelligence, adaptability, resilience, and collaboration of human beings. In human history, those grave crises were often great opportunities for new inventions—technological or institutional—to advance human society and wellbeing. This little essay, hopefully, drills out some opportunities out of the COVID-19 crisis.

### Declaration of competing interest

No conflict of interest is declared.

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