LEADERSHIP

Designing a digital workplace: Introducing
complementary smart work elements

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NEW WORKING
PARADIGMS

THE CAPCO INSTITUTE

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CONTENTS

WORKFORCE

ORGANIZATION

DEAR READER,

Welcome to edition 52 of the Capco Institute Journal of Financial Transformation.

Transformation has been a constant theme in our industry for several decades, but the events of 2020 have accelerated change in employee working patterns, and in the very nature of the workplace itself. This Journal examines three key elements of these new working paradigms – leadership, workforce, and organization.

As we explore in this edition, a key part of any firm's transformation agenda centers around digital leadership and how to tackle the novel challenges created by changes within organizations and society. Leaders need advanced organizational skills to build teams that use digital technologies, as well as to inspire millennial workers who have grown up in a digitally transformed world. They also need deeper technology skills to lead, and a broader understanding of the ethical paradigms introduced by the challenges created through new technologies such as AI. These enhanced skillsets will help today's leaders and their teams fully realize the benefits of new working models.

The topics reviewed in this Journal offer flexibility for employees, increased agility for teams, and a combination of both for organizations. When supported by the right technology, these can create collaborative, outcome-driven environments. Through the resulting remote or hybrid models, organizations can transform their workforce and operations to boost productivity, cost effectiveness and employee engagement, while enhancing resilience and customer experiences.

As always, our contributors to this Capco Journal are distinguished, world-class thinkers. I am confident that you will find the quality of thinking in this latest edition to be a valuable source of information and strategic insight.

Thank you to all our contributors and thank you for reading.

Lance Levy, **Capco CEO**

DESIGNING A DIGITAL WORKPLACE: INTRODUCING COMPLEMENTARY SMART WORK ELEMENTS

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ABSTRACT

Organizations are taking advantage of new technology to change the way they work in response to the increasing complexity and unpredictability of the business environment. Simply adopting new technology is not, however, enough to ensure the success of a digital workplace design. The technology itself is just one of four key elements that are vital to designing "smart" digital workplaces. The others are the workforce, new ways of working (NWW), and leadership. All four must be considered in terms of the overarching goal the organization is aiming to achieve with its digital workplace transformation. It is crucial to identify the current situation pertaining to each element and any changes required to bring about the desired transformation. Moreover, the four elements are not independent, but interact in various and sometimes unexpected ways; hence, successful digital workplace design must take into account the complementarities between the different elements and adapt accordingly.

1. INTRODUCTION

The rise of the digital economy is fundamentally changing the way organizations worldwide operate their businesses and deliver value to customers. Increasingly, organizations have to maneuver in a world of volatility, unpredictability, complexity, and ambiguity [Baptista et al. (2020)]. In such an environment, organizations need to react quickly to ongoing changes that are often out of their control [Attaran et al. (2020)]. It is becoming more difficult to anticipate events or predict how they will unfold, which means organizations have to take action without much certainty. Furthermore, an organization's environment is more complex and dynamic, with many interdependencies, making it difficult to get an overview of how things are related. Finally, the demands on organizations and management are often contradictory and paradoxical, hence organizations may find they have to act in situations that are unfamiliar and outside the range of their expertise [Forman et al. (2014)].

A number of macro forces, such as globalization, the drive for sustainability, population growth and aging, the rise of emerging economies, and technology trends, are affecting future work trends in different industries in different ways [Sørensen and Pillans (2012)]. In terms of future organizations, new designs, such as networked and flat organizations, are growing in importance – in these designs, many objectives are achieved through collaboration with partners and external contributors rather than with permanent employees [Cappelli and Keller (2013), Evans et al. (2004)]. Hierarchies are replaced with fluid, flexible project teams that work in agile ways [Cappelli and Keller (2013), Okhuysen et al. (2013)]. In terms of future working, there will likely be different impacts on how work is conducted. For example, routine-based and repetitive tasks are being automated, outsourced, or moved offshore [Brynjolfsson and McAfee (2014), Frey and Osborne (2013), Willcocks and Lacity (2016)]. Work that is based on

Figure 1: The future world of work

GLOBAL CONTEXT	
VOLATILE	UNCERTAIN

FUTURE WORK THEMES
Future organizations
Future working
Future careers

IMPLICATIONS
Strategy and planning
Leadership and culture
Talent
Performance

MACRO FORCES
Global risks
Sustainability
Population trends
Emerging economies
Technology

PARADOXES
Innovation versus optimization
Flexibility versus governance
Anytime/anywhere versus boundaries
Process versus outcome

COMPLEX	AMBIGUOUS

Adapted from Sørensen and Pillans (2012)

knowledge and expertise is expected to be enhanced rather than replaced by technology [Baptista et al. (2020)]. In terms of future careers, more people will choose to work independently, which will decrease the number of full-time, permanent workers. In addition, more people will accept itinerant work for reasons of economic necessity [Spreitzer et al. (2017)].

These future work trends introduce a number of paradoxes. One is that organizations need to find a balance between growth through innovation and entering new marketplaces and the need to continue exploiting their existing businesses [O'Reilly and Tushman (2013)]. Another paradox is that work can be done anywhere, anytime due to the proliferation of technology and to flexible work options, but such flexibility necessitates some clear work-life boundaries for the individual worker to avoid burnout [Stein et al. (2015)]. A further paradox could be the need to respect employees' individual and collective desire for flexibility in decision-rights while maintaining some level of governance structure of decision-rights in the organization as a whole [Ross et al. (2019)]. Finally, there may be a paradox in how leaders choose to measure the performance of their workers – whether it is on process or the outcome of their work. As long as workers produce the expected outcome, leaders might wish to ignore the process. Yet, some process measures may be important as a way to figure out how to continuously improve processes and become more innovative [Eckhardt et al. (2019)].

As illustrated in Figure 1, these macro forces, future work trends, and paradoxes combine to generate implications for both strategy and operations. For example, many organizations need to improve their corporate foresight capabilities to ensure that future work trends become part of their strategic direction and daily planning [Rohrbeck et al. (2018)]. There will also be a need for a new style of leadership that shifts from traditional command-and-control towards visionary communication and collaboration [Eseryel and Eseryel (2013)]. Visionary leaders tend to be more externally focused and better at identifying new opportunities. Furthermore, leaders need to be able to create and support collaborative environments that foster innovation. Finally, in terms of new ways of working, there will be a need for more flexible career structures [Spreitzer et al. (2017)] and flexible work practices, at the individual, team, and organizational levels [Crocker et al. (2018), Van Diermen and Beltman (2016)].

Collectively, such considerations paint a complex picture of the future world of work. In this paper, we aim to provide suggestions for how organizations can design a digital workplace that tackles this complexity by including a holistic organizational configuration of people, processes, and technologies to improve operational efficiency and to meet organizational goals [Attaran et al. (2020), Ross et al. (2019)]. These suggestions are based on our own and others' state-of-the-art research studying various aspects of work digitalization

[Baptista et al. (2020), Gal et al. (2020), Stein et al. (2015), Ross et al. (2019)], as well as discussions we have had with numerous executives from different industries as part of our teaching engagements at the Copenhagen Business School. The ambition is to propose ways in which organizations can build a digital workplace that supports a new mindset and that drives new behavioral norms in the organization. We argue that new mindsets and behaviors can be created through a synergy of four elements that work together:

1. Technologies of the digital workplace
2. The workforce
3. New ways of working (NWW)
4. Leadership

While we cover each element on their own, we emphasize how these elements work together, sometimes in unexpected ways. It is important to point out that we do not believe that there is one ideal digital workplace arrangement that works across different contexts or even within any one organization [Raguseo et al. (2016)]. Rather, we may be moving towards a future where multiple digital workplace arrangements need to coexist harmoniously [Ross et al. (2019)]. The starting point for organizations when designing digital workplace(s) is to think in terms of complementary "smart work" elements, as described next.

2. SMART WORK ELEMENTS

Smart work is a new worldview, which covers "all the fundamental aspects that determine work, how it gets done, what motivates the worker, and what guarantees the output" [Boorsma and Mitchell (2011)]. Overall, smart work uses digital technology to transform the "workplace" so that work can actually be performed independently of time and place [Raguseo et al. (2016)]. In a smart work culture, the established archetype of 9-5 office work is replaced with working anytime. Similarly, the physical office space is replaced with working from anywhere [Boorsma and Mitchell (2011)]. Furthermore, smart work fosters a social and collaborative work environment based on a networked way of operating that determines how, when, and where work is done. Because of networking technologies, organizations can both optimize their existing work practices and create new ones.

Within the framework of "smart work", we introduce four elements that we consider vital for designing "smart" digital workplace(s) (Table 1).

Next, we briefly describe each of the four elements necessary for designing "smart" digital workplace(s).

Table 1: Smart work elements

SMART WORK ELEMENTS	CHARACTERISTICS
DIGITAL TECHNOLOGY	Digital technology serves as a vital trigger for, and enabler of, smart work practices: digital technology is used to support communication and collaboration, social networks, telework, VR, file sharing, real-time data, mobile work, etc.
WORKFORCE	Workforce characteristics, qualifications, and competencies: these include level of education, IT literacy, skills (upskilling and reskilling), autonomy, motivation, satisfaction, flexibility, readiness, etc.
NEW WAYS OF WORKING	New ways of working covers the extent to which employees can manage their working conditions in a flexible way: this includes cultural change, organizational development, agility, flexibility, etc.
LEADERSHIP	Leadership styles and leaders' ability to influence others: these provide a vision, create consensus, demonstrate emotional intelligence or common sense, etc.

Adapted from Raguseo et al. (2016)

2.1 Technologies of the digital workplace

The digital technology element is often considered as a vital trigger for, and enabler of, new workplace design [Raguseo et al. (2016)]. The development and diffusion of digital technologies and services can support new forms of communication, file sharing, collaboration, and social networking. Employees can use digital technology to interact effectively in real time, even if they are scattered in disperse settings, thereby optimizing their work processes and production [Baptista et al. (2020)].

While technology plays a key role in digital transformation, defining what we mean by workplace technology is not straightforward. Overall, workplace technologies "refer to a range of digital services that enable work within organizations" [Baptista et al (2020)]. According to Gartner, the evolution of digital workplace technologies can be divided into four generations [Attaran et al. (2020), Levy (2015)]. First generation technologies include audio and video conferencing tools, as well as technologies that support group scheduling and discussion forums. The overall aim of first-generation technologies is to increase productivity and to improve internal and external communication [Attaran et al. (2020)].

With second-generation digital workplace technologies, the purpose is to optimize the workspace and to ensure real-time collaboration by use of web-based technologies for instant messaging, online conferencing, and virtual teams. The third generation of digital workplace technologies includes the use of mobile devices, file sharing technologies, and the cloud to provide platforms that support knowledge sharing, real-time decision making, as well as the creation of communities of interest. Finally, the fourth generation includes emerging technologies such as artificial intelligence, machine learning, and robotic process automation to ensure timely decision making and process optimization [Attaran et al. (2020), Eckhardt et al. (2019)]. Over time, organizations have adopted increasingly more complex workplace technologies [Baptista et al. (2020)]. Whereas early workplace technologies supported individual office work (e.g., calculators, emails, and mobile devices), later technologies, such as knowledge management systems, collaboration platforms, and social media, supported group interactions. Most recently, we find advanced workplace technologies that include artificial intelligence, sensors, as well as integrated digital platforms to augment work practices [Baptista et al. (2020)].

Alternatively, workplace technologies can be categorized in terms of their scale. This approach highlights the diversity of workplace technologies. Technologies can range from large-scale global infrastructures like the internet to tiny sensors, with platforms, enterprise systems, and personal devices in between [Sørensen (2017)]. This way of conceptualizing workplace technologies clarifies the role of technology at work on three levels: small, large, and at scale [Sørensen (2017)]. Technology in the small refers to the increasing miniaturization and personalization of computing devices. This includes both individual members of the organization having direct access to computing wherever they are, and also the use of "machine-to-machine" (M2M) technologies that operate without direct human engagement. Both result in greater convenience and flexibility for individuals, but also make those individuals increasingly dependent on digital devices. Technology in the large refers to the expansion of digital networking activities in organizational computing (such as ERP (enterprise resource planning) systems, customer engagement platforms, and supply chain management networks). Connecting into global networks and digital infrastructures enables the development of inter-organizational processes and the creation of new platforms. Lastly, technology at scale refers to complex digital computational processes taking advantage of the exponential growth in computing capabilities [Sørensen (2017)]. These are both data and processing intensive, and will often be carried out in some form of distributed cloud service arrangement, but can also be located within an organization's data center. This level captures computation that powers capabilities like Google search or Amazon Web Services.

There are also technologies that bridge the small, large, and at scale. One example is the SAP CoPilot – a digital assistant for the enterprise (now part of SAP Conversational AI). In the small, CoPilot is an app that an individual can run on their phone. In the large, it draws on business data, data from other applications, as well as on external data to which a business has access. At scale, CoPilot links to data, networks, and computing capabilities that are not owned by SAP, like Amazon Web Services, Microsoft APIs, and the like. In short, it leverages a broad network of technologies and global infrastructure to deliver the best decision making aid for enterprise managers.

In summary, unpacking what we understand by workplace technology is important in identifying what generations or levels of technology are currently present in any given digital workplace, and what generations or levels of technology might be needed.

2.2 The workforce

The workforce element refers to the people working for a particular organization. Alternative work arrangements change the relationship between workers and employers. The workforce of the 21st century experiences increased flexibility both in when they work and in where they accomplish their tasks [Spreitzer et al. (2017)]. Furthermore, the contemporary workforce increasingly demands work to be meaningful, preferring a variety of tasks involving different skills and significance. They also demand greater autonomy, more feedback, and richer measures of responsibility [Lysovaa et al. (2019)]. These workforce demands raise important considerations about the qualifications, competencies, and IT skills of the employees. Leaders can decide to hire workers with the skills needed, but the supply of technical talent is often limited [Donovan and Benko (2016)]. Another approach is to upskill and/or reskill the existing workforce.

New workforce trends go hand-in-hand with changing workplace demographics. There is an increasing number of "born-digital" millennials and other digital-savvy employees. Furthermore, employees want their experience of work to be flexible, real-time, technology-driven, and collaborative. Based on current knowledge of new workforce trends and

the demand for flexibility, Spreitzer et al. (2017) classify "alternative work arrangements" along three dimensions: employment, scheduling, and location. The first dimension is about flexibility in the employment relationship. This includes shifts from standard terms of employment to shorter-term work assignments, such as part-time work, on-call work, seasonal work, freelancing, and contracting. An increasing number of so-called gig workers provide on-demand services via online platforms. Examples could be Uber drivers or workers who offer to do odd jobs on the American online marketplace, TaskRabbit, but also highly skilled programmers and data scientists offering their services on platforms like TopCoder. The second dimension is about flexibility in how work is scheduled. For example, workers can work in such a way as to accommodate customer demands and the changing internal needs of the organization. Research shows that it will lead to less absenteeism when employees can schedule private appointments during working hours and make up for the missed work time later on [Spreitzer et al. (2017)]. The third dimension is about flexibility in the location of where work is accomplished. Today, most work can be performed outside of the place of employment, for example with clients, and people are increasingly working from home, cafes, their summerhouse, or some other location.[1]

Each type of flexibility comes with benefits and challenges for the employer and employees. Research shows that flexibility in where work is conducted is beneficial to the individual worker, as it will often lead to a reduction in work stress, and increase the feeling of autonomy, job satisfaction, and job performance [Lysovaa et al. (2019), Stein et al. (2015)]. At the same time, there are also downsides to such flexibility. Leaders should be concerned about how changes in work arrangements affect the way work is accomplished and how people feel about their work. Technology makes it possible to work longer and harder than employees can cope with [Stein et al. (2015)]. When employees can conduct their work wherever they are, the danger is that all spaces and all times become workspaces and work times. Furthermore, because a manager can always see whether a worker is online or offline, the worker can worry about the consequences of being offline "too much". Over time, the separation between being a "private individual" and a "working professional" may become blurred. Conversely,

recent research also shows that employees working at a distance may fear being overlooked, forgotten, left out, or ignored by management [Hafermalz (2020)]. Because of such fear, workers are not concerned about being monitored. On the contrary, they use technology to put themselves "on display" in order to gain attention, influence, and approval from peers and especially management.

To address such dilemmas, Eckhardt et al. (2019) present three readiness dimensions for leaders to consider when preparing their workers to work in flexible ways. First, there is "mental readiness", which concerns whether an employee or group of employees is mentally ready to work in new ways. For example, remote workers should be able to balance both personal and work activities – and manage non-work-related sources of stress while working. Due to the high exposure to technologies, such workers may suffer from techno-stress [Tarafdar et al. (2007)], which may result in work overload, invasion of privacy, and role stress [Ayyagari et al. (2011)]. Second, it is important to consider the "technology readiness" of the organization and whether it is technically geared to support new ways of working [Eckhardt et al. (2019)]. For example, various technologies are needed to enable in-office and remote employees to work closely together. Advanced communication and collaboration skills can enhance working relationships, including know-how in terms of working efficiently with digital media. Technology readiness is also about employees' ability to identify and use relevant information. Third, it is important to assess the "relationship readiness" among team members, so as to create a common identity and foster the mutual trust team members need in order to accomplish highly complex tasks as efficiently and effectively as possible [Eckhardt et al. (2019)]. Here, it is important to provide enough autonomy to the individual and to the team of individuals to unleash creativity. The relationships between a leader and individual should be based on trust rather than control [Lysovaa et al. (2019)].

Unpacking the workforce element is important in identifying the current level of workforce flexibility in any given digital workplace, as well as identifying what flexibility is needed. Similarly, it is important to consider what level of workforce readiness is needed when designing digital workplace(s).

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[1] With the COVID-19 pandemic, flexibilities in scheduling and location are becoming increasingly important so that businesses can adjust to the new realities of movement restrictions and social distancing to which employees must adhere. Meanwhile, employment flexibility may offer businesses alternative ways of keeping workers at least partially employed despite temporary financial difficulties.

2.3 New ways of working

Broadly, the new ways of working element includes those policy and administration practices that enable employees to exercise flexibility in their work [Raguseo et al. (2016)]. This could include training programs, new communication plans, new goal management systems, projects that support cultural change, organizational development, and competence development. Smart work requires new standards and a specific working culture that changes the attitude and behavior of employees to promote innovation and risk-taking.

In line with van Diermen and Beltman (2016), we discuss new ways of working at the individual, team, and organizational levels. At the individual level, new ways of working refer to four principles. The first is that employees should be autonomous in managing their own work. Leaders need to exercise trust, not control, and work should be organized independently of location and time. The second principle is that employees should have unlimited access and connectivity, hence the workplace should offer an easy and accessible digital experience. The third principle is that employees should have flexible working relationships. This means that they operate under the principle of "my size fits me", not "one size fits all", and can regulate their own patterns of work. Finally, and as the fourth principle, employees should be goal driven. This means instituting an experimental mindset, so leaders think in terms of metrics over directives.

At the team level, new ways of working refers to agility created through group-level networks formed from employees throughout the organization. Agility in a team can be nurtured by avoiding collaborative overload, engaging the fringe to better resource teams, and leveraging boundary spanners for learning and knowledge-sharing [Crocker et al. (2018)]. Research has shown that collaboration is never equally distributed in an organization. Typically, approximately 30 percent of valuable collaborations come from less than 5 percent of employees. As these people become overly relied upon, they are more likely to experience burnout and eventually resign [Cross et al. (2016)]. Consequently, leaders need to encourage overburdened employees to redistribute collaborative work by agreement with their immediate manager. Agility requires the integration of different capabilities and perspectives, but those who are new to a group, or who do not necessarily see things in the same light as others, are often left out of key projects or teamwork. Research shows that recent hires are at risk of leaving the company before reaching the three-year mark if they are not integrated into projects within the first year [Crocker et al. (2018)]. Leaders can help those on the periphery integrate by creating a demand for their competencies. This can be done, for example, by pairing newcomers with network influencers as part of staffing or mentoring. Agility also requires learning and knowledge sharing via forums or special events that bring together employees from different organizational functions, thus converting them into boundary spanners [Crocker et al. (2018)].

At the organizational level, new ways of working refers to an integrated approach focused on bricks, bytes, and behavior [van Diermen and Beltman (2016)]. Whereas bricks concern real estate, housing, and facilities, bytes refer to computing networks, including hardware and software. The third aspect, behavior, is considered a key determinant of success when building a new workplace. Behavior reflects the human factor, and it is argued that leaders "...should manage on output in a flexible working environment where trust, responsibility, result-driven and autonomy are key aspects to perform well" [van Diermen and Beltman (2016)]. An integrated approach to all three can help establish new behavioral norms in an organization. The individual flexibility and team agility discussed above must be supported by appropriate technologies (bytes) as well as appropriate physical facilities.[2]

In summary, unpacking the new ways of working element is important for identifying what new ways of working are already present and what new ways of working are needed in any given digital workplace.

2.4 Leadership

The leadership element concerns leaders' ability to influence others, to change organizations, provide a vision, create consensus, to use emotional intelligence, or even common sense. There is little agreement in research as to whether leadership is about inherent traits, skills, and/or behaviors [Van Wart (2013)]. While this remains an open question, there is some agreement that good leadership behaviors can be learned. Next, we introduce six well-known styles of leadership with different behaviors [Goleman et al. (2013)].

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[2] We do not focus on the bricks element in this paper, but interested readers can learn more about the importance of the physical facilities in van Diermen and Beltman (2016) and Raguseo et al. (2016).

The commanding leadership style is best captured by the phrase, "Do as I say!" Commanding leaders require immediate compliance with their demands. The commanding style is useful for creating fast results but can impede organizational flexibility and lower employee motivation. By contrast, the visionary leadership style is best captured by the phrase, "This is where we are heading: come with me!" Visionary leaders will motivate their employees by showing the way, and work best when clarity on direction is needed. The affiliative leadership style is best captured by the phrase, "People first". The leader will focus on creating harmony and emotional bonds. This is particularly effective when trying to improve morale and the sense of being a team, but the premium placed on recognition can result in a failure to criticize underperformance. The democratic leadership style is best captured by the phrase, "What do you think?" By giving employees a say in the decision process, the leader builds up responsibility and flexibility within the organization. The downside of this style is that it can waste time on endless meetings. The pacesetting leadership style is best captured in the phrase "Do as I do, now." This establishes standards of performance by example, and is most effective with self-motivated and competent employees. Finally, the coaching leadership style is best captured by the phrase, "Try this". Such leaders aim to develop future employees, and to that end will let others experiment with new solutions and generally seek to ensure independence.

According to this framework, the key to success is variation [Goleman et al. (2013)]. Leaders who have taught themselves how to vary between different leadership styles generate the best working climate within their organization and produce the best results. Similarly, in many workplaces the styles could be distributed among different individuals in the leadership team. In a digital workplace, it will be crucial to consider how these different styles can be used together to foster new ways of working, such as employees managing their own work and forming agile teams.

Each of the six styles of leadership embodies a different way in which leaders can influence new behavioral norms in the organization [Maitlis and Christianson (2014)]. In the visionary leadership style, where clarity on the direction is required, leaders can actively frame and disseminate visions and ideas to others to increase their understanding through sensegiving. Here, sensegiving practices include offering descriptions and explanations, and presenting a trustworthy and consistent narrative. A leader can give sense by explaining the who, what, how, when, and why, as well as by providing personalized information to help employees understand how the new digital workplace design will affect them. The leadership team often plays an important role here in clarifying the vision, the values underlying it, and the actual changes required to obtain the desired results [Van Diermen and Beltman (2016)]. However, it is not only leaders that give sense. Others, such as change agents, project managers, and technology super users may also facilitate sensegiving in a more collaborative style [Maitlis and Christianson (2014)].

Different forms of organizational sensemaking [Maitlis and Christianson (2014)] align with the different leadership styles or their combinations. "Guided" sensemaking happens when leaders are actively engaged in constructing understandings and explanations and communicating them to employees. This way, employees are very much engaged in sharing their views and ideas about new ways of working. This can be achieved through a combination of visionary, pacesetting, and democratic leadership. Conversely, "restricted" sensemaking happens when leaders convey overarching explanations to their employees, who tend to accept what they are being told, with few alternative understandings being provided. This approach depends mainly on visionary leadership. It can be advantageous when everyone understands the workplace digitalization initiatives, but it may also reflect an organizational culture in which employees are trying to ignore change. "Fragmented" sensemaking emerges when employees speak up, raise issues, voice concerns, and argue for possible solutions and leaders rely mostly on democratic and affiliative leadership styles rather than trying to organize or guide discussions. In this context, attempts to establish a new work culture may create a chaotic environment and fuel rumors, and most likely not a shared idea of where the organization is heading. Finally, "minimal" sensemaking occurs when both leaders and employees are passive and await each other's reactions to a given situation, often in response to some external trigger. This is also likely to be detrimental to the success of a new workplace design.

In summary, unpacking the leadership element is important in identifying the style or combinations of styles of leadership that are present in any given organization, and those that are needed for effective sensemaking around a new digital workplace arrangement.

Table 2: Strategic complementarities: a practical approach

GOAL: IDENTIFY AND DESCRIBE THE OVERALL TRANSFORMATION GOAL	(1)	(2)	(3)	(4)
(1) Identify and describe a technology capability to achieve the goal		+	+	+
(2) Identify and describe a workforce solution complementary to technology to achieve the goal			+	+
(3) Identify and describe new ways of working complementary to technology and workforce to achieve the goal				+
(4) Identify and describe leadership capability complementary to technology, workforce and new ways of working to achieve the goal				

Adapted from Brynjolfsson and Milgrom (2012)

3. ELEMENT COMPLEMENTARITIES

The four "smart" digital workplace elements described above are not independent of one another. To tease out their interdependencies, we draw on the notion of complementarities. Complementarities are one way of thinking about the combined effect of multiple elements in a configuration. Complementarity or synergy is "the interaction of two or more forces so that their combined effect is greater than the sum of their individual effects" [Brynjolfsson and Milgrom (2012)]. For example, an organization is likely to have an overarching goal they are aiming to achieve with a digital workplace transformation. The organization is then likely to reach a number of decisions and implement multiple initiatives related to technology, workforce, new ways of working, and leadership in order to achieve this goal. The key insight from a complementarity analysis is that these decisions and initiatives "interact" – while each individually may help achieve the overall goal, their interactions might not [Brynjolfsson and Milgrom (2012)]. In designing a digital workplace arrangement, it is, therefore, essential to consider how the decisions and initiatives "complement" or "contradict" each other. In Table 2, we visualize a complementarity analysis for designing a digital workplace.

Each decision about a particular element is numbered and labeled and appears in both a row and a column. Because the complementarity relation is symmetrical, it is enough to check just the upper half of the table. Shaded in grey are those entries that do not need to be checked. A plus sign in the cells of the table represents a complementarity that is hypothesized to be present, a blank cell would represent a lack of a direct interaction and a minus sign would represent a contradiction. In the context of designing digital workplace

arrangement(s), the aim is to analyze planned initiatives related to technology, workforce, new ways of working, and leadership to ensure they are as complementary as possible, while avoiding contradictions.

Interestingly, while complementarities are essential for a successful transformation, complementarities are also the reason widespread change is difficult. Because of complementarities, changing only one practice or a few practices at a workplace (e.g., switching to agile principles in teamwork without providing necessary technological support, workforce training, or coaching by leaders), is likely to reduce overall performance. Nevertheless, making multiple changes at once can be difficult because of coordination challenges, implicit mental models, existing assumptions, heuristics that carry on even when explicit practices are changed, as well as synchronization and timing issues [Raguseo et al. (2016)]. Furthermore, it is essential to think about "why" a transformation is necessary to begin with. After all, complementary initiatives cannot be designed effectively if the overarching goal is unclear or underspecified.

In the context of designing digital workplace(s), the starting point is, therefore, always an overarching goal or vision for the transformation. This answers the key question: "why are we building a digital workplace?" Then decisions should be made regarding which smart work elements to put in place and how they are evaluated in relation to this goal and to each other. Given that being digital is key to a digital workplace, a concrete starting point is then to consider how to use technology to achieve the specified goal. It is essential, however, that the digital workplace transformation does not stop with technology capabilities. Instead, the next step would be to consider how to achieve the specified goal with a

Table 3: Strategic complementarities: example

GOAL: UNIVERSITY BECOMES A LEADING ONLINE EDUCATION PROVIDER	(1)	(2)	(3)	(4)
(1) Complementary decision re technology (e.g., partner with an interactive online learning platform; no point in building one's own)		+	+	+
(2) Complementary decision re workforce (e.g., hire temporary help for content production; reduce permanent teaching staff)			+	+
(3) Complementary decision re new ways of working (e.g., retrain professors in online teaching)				+
(4) Complementary decision re leadership (e.g., share and shape vision of future education in own region)				

workforce solution that is also complementary to the desired technology capability. This is followed by a consideration of how to achieve the specified goal with new ways of working that are complementary to the desired technology capability and the workforce solution. Finally, the complementarity analysis considers how to achieve the specified goal with a leadership capability that is complementary to all of the above. As more elements are added, the complexity of the analysis and the planning increases, but so does the likelihood of generating an integrated, coherent digital work arrangement.

To demonstrate the procedure of thinking through complementarities, we introduce the case of a university management team that wants to become a leading online education provider in their region – this is something many universities have been moving towards for a number of years and the process has been dramatically accelerated due to the COVID-19 pandemic. The first thing for the university to consider is how to achieve this goal with a technology capability. For example, the university might decide to partner with an interactive online learning platform like Coursera instead of building its own platform, as that is not its core competency. The next step is to consider how to achieve the goal with a workforce solution that is also complementary to the technology capability. The university management team may decide to hire temporary help to get started on producing content, and then reduce permanent teaching staff over time. This will help the university move fast, and complements the strategy of partnering with a platform; i.e., the university will focus on scaling up content production, which is its core competence, while limiting its responsibility in terms of developing and maintaining technology. Next, the

management team needs to consider how to achieve the goal with new ways of working that are complementary to the technology capability and the workforce solution. Here they may decide to retrain professors in online teaching. One could argue that this decision is complementary to partnering with an online platform and to hiring temporary help, as it helps the university in focusing both on their core competency and long-term sustainability. Temporary help allows the university to scale, but it needs renowned professors in order to produce high-quality content that will set them apart from competitors on Coursera. Next, the management team should consider how to achieve the goal with a leadership capability that complements the other three solutions. Here they may decide to focus on a combination of visionary and democratic leadership styles, emphasizing the importance of sharing and shaping the vision of future education locally and globally, while including other university stakeholders in making this vision operational. Arguably, a clear and strong vision will help bring university staff and academics on board for the retraining, it will help alleviate concerns regarding potential reductions in teaching staff, and it will set the university apart from competitors on Coursera. Finally, it is important to note that many iterations of a complementarity analysis may be needed. In this case, questions regarding each of the elements, as well as the overarching goal, may arise that necessitate rethinking the initiatives. For example, the university may want to reflect on whether their goal is to become a leading "online" education provider or a leading "blended" education provider, depending on their market position, placement in rankings, and attractiveness to domestic and foreign students. We have summarized the example in Table 3.

Table 4: Questions to ask when designing a digital workplace

TRANSFORMATION GOAL	TECHNOLOGY SOLUTION	WORKFORCE SOLUTION	NWW SOLUTION	LEADERSHIP SOLUTION	COMPLEMENTARITIES
Is the scope and timeline of the chosen goal/ problem realistic?	What technology solutions are needed? (e.g., among the four generations)	What would be the workforce's demands in terms of flexibility?	What new ways of working practices (individual, team, organization) are needed?	What leadership style(s) are needed? (commanding, visionary, democratic, etc.)	Are the described elements (technology, workforce, new ways of working, leadership) complementary?
Is it the right goal/ problem? Why does it need to be addressed? (e.g., optimize processes, generate new digital offerings)	What level(s) of computing are needed? (e.g., small, large, scale)	What actions are needed to improve the workforce's readiness?	What levers need to be in place to support new ways of working? (bricks, bytes, behavior)	How to facilitate organizational sensemaking?	

4. CONCLUSION

Identifying the four elements and their complementarities helps leaders set the strategic agenda and plan the design of their workplace. Such effort requires as its starting point an overarching goal or vision for the transformation, including careful consideration of its ambition, scope, and timeline. Since organizations have to maneuver in an increasingly uncertain, complex, and paradoxical environment, in which they need to adapt to ongoing changes that are often out of their control, it is vital for the success of the digital workplace design that leaders consider "why" a digital workplace is needed in the first place and whether the goal is realistic. Furthermore, they should discuss what smart work elements are necessary to realize it – see Table 4 for guiding questions that leaders can ask when designing a digital workplace.

Once the transformation goal for the digital workplace is defined, it needs to be made concrete. A starting point is to consider what technologies are already available in the organization and/or what IT solutions are accessible on the market to attain the goal. Furthermore, the IT department should consider how a combination of different levels of computing (small, large, scale) can help achieve an integrated approach. It is important to remember that "a successful digital transformation is not a technology-driven endeavor – rather, more than anything else, it is a cultural and organizational transformation" [Attaran et al. (2020)].

Consequently, the next thing to consider is what workforce solution is needed to achieve the transformation goal. Here, a good starting point for analysis would be inquiring into employees' own demands for flexibility in terms of type of employment, schedule, and location. It is also important to identify their readiness for digital workplace transformation along the three dimensions of mental, technology, and relationship readiness. For example, mental readiness reflects whether an employee is mentally ready to work in new ways. Actions for achieving mental readiness include hiring people with the right skills and attributes, or reskilling or upskilling the existing workforce [Donovan and Benko (2016)].

The next item to consider is what new ways of working practices are needed at an individual, team, and organizational level. It is also worth considering what levers are in place to help establish new behavioral norms in the organization. Here, it is important to provide training in the new ways of working, as well as supporting workers in their time management and in their interactions with others. Similarly, management needs to make sure workers are ready to engage with coworkers in new ways.

Such considerations lead to the final element, which concerns the type of leadership in place to ensure the necessary changes (commanding, visionary, democratic, etc.). For example, it is important for leaders to win their employees' trust by communicating with clarity, being transparent, and by showing appreciation. One approach is to establish a culture that facilitates guided organizational sensemaking. Having identified the issues to address within each of the four elements, it is time to ask whether and how the elements are complementary, and to proceed or adjust accordingly.

Good luck on designing your digital workplace.

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