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Reflection note

Digital Transformation of Work

Reflections from IRIS/SCIS keynote 2018

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1 Keynote topic for IRIS/SCIS 2018

The key focus of my keynote was to discuss some of the consequences of increased digitalization of work at individual and organizational levels. Inspired by our research theme on the ‘digital transformation of work’ at the Department of Digitalization at Copenhagen Business School (CBS), the main topic of the keynote was to concretize and exemplify what this transformation implies and to clarify the role, promises, and challenges of digital technology in a work context. In close collaboration with industry partners and international research collaborators, we conduct research on ‘mobile and flexible work,’ where we study how new work practices can create a feeling among knowledge workers of both flexibility and autonomy, but also of constant availability, increased control, and monitoring. We are also interested in the topic ‘workforce/people analytics,’ where we study what happens when managers monitor the behavior of their employees (e.g., performance levels, who is likely to leave the company, and who will be successful candidates for a new job) with big data and advanced algorithms. The broader topic of ‘algorithmic management’ covers how algorithms may make management as we know it today redundant. We take a critical view of this phenomenon and discuss whether managers can in fact make better decisions by using algorithms instead of human judgment. The most recent project within the research theme takes the UN’s global goal of decent work seriously by looking at how we can use digital technology to design decent working conditions for different kinds of workers (i.e., gig workers, new nine-to-fivers, traveling elites, and digital nomads).

The digital transformation of work is not a new topic. Several books and articles have been published on the impact of digital technology on work. I will mention a few books here that have provided inspiration for further research on this topic. The sem-

inal work by Zuboff (1988), *In the Age of the Smart Machine: The Future of Work and Power*, provides important insight into how increasing use of information technology is altering the nature of work and the dynamics of the workplace. Zuboff highlights how social, political, and economic interests shape the use of digital technology and human choices. Brynjolfsson and McAfee (2014) present similar thoughts in *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, where they argue that as massive technological innovations radically reshape our world, we need to develop new business models, new technologies, and new policies that take advantage of these developments to amplify human capabilities. In *Service Automation: Robots and the Future of Work* by Willcocks and Lacity (2016), the discussion centers on the implications of replacement of workers with robots. The authors argue that managers should think through how technology and humans can work together symbiotically and how technology can empower workers in exercising judgment and making decisions. With regard to human-technology interaction, Susskind and Susskind (2015) pose two vital questions in *The Future of the Professions: How Technology Will Transform the Work of Human Experts*: “what are the prospects for employment?” and “what tasks should be reserved exclusively for people?” Similarly, the book on *The Impact of ICT on Work* by Lee (2016) zooms in on different scenarios regarding the impact of ICT on various aspects of the workplace: job crafting, alternative work arrangements, telecommuting, gamification, and new work skills. In *Enterprise Mobility—Tiny Technology with Global Impact on Work*, Sørensen (2011) discusses this impact and presents some of the challenges posed by resolving the paradox involved facilitating fluid working arrangements while cultivating interaction, collaboration, and control barriers. The most recent book, *Work: The Last 1,000 Years* by Komlosy et al. (2018), discusses the complexity and contradictory nature of work throughout history.

Added to these important contributions, there are a number of research articles, consultancy reports, blogs, and debate sections on this rather broad research topic. In current public debate, digital transformation of the workforce is mainly attributed to automation in the form of artificial intelligence (AI), machine learning, and robotic process automation (RPA). Automation is a hot topic that gets a lot of media coverage because it links increased use of digital technology to potential unemployment (McKinsey 2017). While automation is an important topic for industry and researchers alike, it is only one element in the digital transformation of work. In keeping with the conclusion of the McKinsey report, I would argue that automation (robots and algorithms) should complement humans rather than replace them entirely. Hence, I believe—as Willcocks and Lacity (2016) have also argued—that we need to look at digital work

as a broader phenomenon and deal with new work practices where people and digital technology work together.

Although research has inundated with important contributions, we are still far from resolving all the important issues in this area. This is most likely why we are seeing increased calls for papers, special issues, and workshops related to this phenomenon in recognized journals and at conferences in Information Systems (IS) and Management Studies. We have three long-standing and recurring workshops in the IS field that deal with the interplay between technology and work/organization. One is the IFIP 8.2 working group, which focuses on the development and use of information technologies in organizational contexts. The topic of this year's meeting is "Living with Monsters? Social Implications of Algorithmic Phenomena, Hybrid Agency and the Performativity of Technology." Another important yearly event is the Organizations, Artifacts and Practices (OAP) workshop, which brings together researchers interested in identifying and analyzing the new trends in digital, distributed, community-oriented, open, and collaborative work practices. Finally, I would like to mention the pre-ICIS workshop, the Changing Nature of Work (CNoW), which is focusing this year on how to build bridges between people, data, and things at the workplace. Also Management Studies and IS journals call for papers in special issues on this topic.¹ These events and calls for papers indicate that the digital transformation of work is an important topic for IS scholars to debate and research. In this keynote reflection, I would like to highlight some of the promises, benefits, and configurations that accompany the increased digital transformation of work. Building on existing research insights, I will discuss the paradoxes and challenges for individuals and organizations caused by working in smarter ways and provide some suggestions for workers and managers to deal with such challenges. I will conclude by proposing research topics for IS scholars.

2 Digital transformation of work conceptualized as smart work

The literature often conceptualizes digital transformation of work as 'flexible work arrangements'; this means that employees can "work anytime, anywhere" (Costas 2013; Mazmanian 2013; Okhuysen et al. 2013; Stein et al. 2015). Another concept for making sense of digital transformations in work models, practices, leadership, and workforce is the idea of 'smart work,' which captures the goal of working digitally in smarter ways. In a broad sense, smart work means "a work practice characterized by spatial and temporal flexibility, supported by technological tools, and that provides all employees

of an organization with the best working conditions to accomplish their tasks” (Raguseo et al. 2016, p. 240). It refers to the goal of working smarter by using digital technology and may include a variety of methods—mobile work, distance work, distributed work, telework, digital nomadism, and crowd work.

Digital technology is considered a supporting tool that contributes to a paradigm shift in the perception of how, where, and when work is performed (Boorsma and Mitchell 2011). When we work with digital technology, it changes our perception of place, i.e. the context in which we work. For example, most knowledge workers no longer depend on offices. Instead, they take their PCs, iPads, and smart phones with them wherever they want and work from home at the kitchen table or from the sofa, from their cottage or sailboat, or in the car on their way to a customer meeting.

When digital technology enables smarter work, it often changes our perception of when work takes place (Nicolini 2007; Stein et al. 2015). It is becoming increasingly difficult to think in conventional nine-to-five working hours. In fact, time becomes somewhat irrelevant, as we can use digital technology for work whenever we wish. This gives us some degree of freedom; we can go jogging or do grocery shopping in peace and quiet during a working day. We can work in the evening when the kids are in bed; in many companies, we are expected to work a little longer, get in a little earlier, and be available after hours if needed. Digital technology also changes our perception of the relationship between technology use and the specific task at hand. Workers increasingly have to ask themselves which digital technology best suits which task. For example, we can benefit from multiple communication channels such as WhatsApp, company intranets, Skype, e-mail, phone, Slack, or Yammer. Finally, increased use of digital technology may very well redistribute tasks between human and non-human actors and make us think about the impact of digital technology on professional identity. The question is, “who am I when I use technology to perform certain tasks?” and equally important, “what am I without the use of digital tools?” Many of us can no longer perform our work without access to the internet, a mobile phone, or other communication technologies. In a recent study on mobile work practices, one of our interviewees talked about digital technology as his “work outfit,” referring to his PC, smart watch, smart phone and the software programs used on various devices. He could not imagine himself as a professional sales person without all this equipment (Stein et al. 2015).

Raguseo et al. (2016) present three key elements that characterize smart work. The first element is the crucial role of *digital technology* in facilitating smart work. Digital technology can support new forms of communication, file sharing, collaboration, and social networking. It allows employees to interact in real time, optimize processes, and

thus improve their production. Here the focus is on the extent to which employees use IT tools (i.e., PC, tablet, smartphone), their use of IT services (i.e., Skype, Twitter, Dropbox, LinkedIn, WhatsApp, etc.), and the extent to which they engage in teleworking. The second element is the *physical space*—the existing layout and possible reconfiguration of the workplace. We can imagine certain spaces that are optimal for creativity and innovation, while other spaces are designed for concentration and reflection. Many organizations choose to reconfigure their entire workplace to create more flexible work conditions for their employees. For example, the case company in our study of mobile work practices altered the physical layout by providing telephone booths for brief client meetings, dialogue rooms, a library for concentration, and sunrooms for the long and dark winters of Scandinavia. The third element covers *HR practices*, i.e., staff policies and administration that support employees in exercising this flexibility (e.g., training programs, new communication plans, and goal management systems, projects that support cultural change, organizational development, and competence development). Smart work practices require new standards and a specific working culture. My co-author and I have added a fourth element to Raguseo et al.'s list; it represents the characteristics of the *workforce* currently working for a particular organization (e.g., IT literacy, level of education, type of work, worker generation). The aim is to create meaningful work for the individual based on skills, professional identity, job satisfaction, and inner motivation. This involves assessment of the need for autonomy, feedback, and the responsibility to ensure effective implementation of flexible work practices.

The overall argument here is that synergies between the different elements may occur that will enhance smart work practices. Raguseo et al. (2016) identify four smart work configurations—‘inconsistent,’ ‘analogical,’ ‘digital,’ and ‘complete’—and argue that complementarities exist between the characteristic elements of a smart work setting. They conclude that a configuration of three elements leads to higher labor productivity. The study by Raguseo et al. (2016) contributes important insight into the idea of creating synergies between the various elements and hence avoiding a deterministic view of the topic of digital transformation of work.

3 Debating whether smart work is smart or just hard work

After stating some of the promises, benefits, and configurations of smart work, it would be important to ask whether smart work is indeed smart for the individual and the organization or just hard. I would propose that we take a double-sided view of digital

technology and the changing nature of work. Hence, while workers will encounter an increasing work mobility, dynamic working arrangements, and the disappearance of organizational boundaries and hence experience that mobility and fluidity may be liberating, such practices will also cause frictions and paradoxes. Johnsen and Sørensen (2015, p. 321) suggest that one of the defining characteristics of smart work is a “constant state of limbo.” For example, the use of mobile devices allows employees to work more flexibly and with increased control over their interactions with others. At the same time, such devices generate a collective expectation of accessibility that can escalate commitment and make employees less likely to neglect work tasks. Using digital technology may also enhance self-perception and well-being in a positive sense by making workers feel accessible and effective. With its steady flow of incoming messages and the increased expectations of others this entails, technology can also induce anxiety in individual workers and make workers feel enslaved rather than liberated. When digital technology is used to reduce the experience of distance to colleagues, constant presence is expected (Tarafdar et al. 2015; Wright and Bonnett 2007). Furthermore, studies show that co-workers can seem distant when talking over Skype.

We have discovered similar dilemmas in our study of mobile work practices (Stein et al. 2015). Here, employees conduct their work where they are. We noticed that most workers face a high degree of ambiguity owing to the paradoxical nature of flexible work practices. The purpose of any particular space, place, and time is becoming unclear and shifting. Workers ask themselves the following question: “If the principle is that I work from where I am, are all spaces and all times now work spaces and work times?” Because superiors can always check whether workers are online or offline, the latter may become unsure about the consequences of being offline ‘too much’ and ask themselves whether they should be constantly connected just because they can be and what happens if they are not. We also discovered situations where the role of the individual worker may be vague and responsibilities blurred. For example, “Who am I when I take a work call on my phone while jogging during a workday?”

The dilemmas encountered in our study can lead to negative outcomes such as stress (Barley et al. 2011; Ramarajan and Reid 2013; Styhre et al. 2002), burnout (Ahuja et al. 2007), and technostress (Ayyagari et al. 2011; Tarafdar et al. 2011; Tarafdar et al. 2015). A report by Eurofound and the International Labour Office (2017), *Working Anytime, Anywhere: The Effects on the World of Work*, found that people engaged in telework and ICT-mobile work experienced stress at work “always or most of the time.” Workers reported greater problems in achieving a work-life balance due to supplemental work (i.e., working beyond normal working hours). The report shows that employees doing telework or using ICT-mobile devices extensively experience more stress

than workers who always work at the employer's premises. That said, the stress levels of regular home-based teleworkers or occasional teleworkers do not differ significantly from those always working at the office. Research shows that smart work practices also lead to positive outcomes such as creativity (Styhre et al. 2002) and job crafting that can increase job satisfaction (Bakker 2011; Wrzesniewski and Dutton 2001).

The use of digital technology has fundamentally changed the relationship between work and life. We know that smart work creates a zone where work and life become indistinguishable and hence pose work-life dilemmas (Johnsen and Sørensen 2015). Many professionals live in an always on, always connected world. This has been labelled the 'availability principle'; workers can expect to be 'on call' at times and in places formerly protected from work (Sewell and Taskin 2015). For many of us, the first thing we do when we wake up in the morning is to grab the smart phone by our bed—which doubles as our alarm clock—and check our work email. Digital technology also means that the boundaries between work and life have become increasingly blurred; we are constantly switching back and forth between family and work roles. Hence, increased use of digital technology has allowed the work domain to interfere with the non-work domain. Similarly, the increasing tendency to bring your own device, service, and application to work may lead to interference by the non-work domain in the work domain (van Welck et al. 2018).

Such flexibility and autonomy in work practices means that many workers struggle to maintain a healthy work/non-work balance. Individuals and organizations increasingly seek solutions to this problem (Ramarajan and Reid 2013). Suggestions include checking email only twice a day, taking regular breaks at work, and turning off electronic devices at home. Volkswagen and other companies have programmed their e-mail servers to stop delivering messages to employee smart phones 30 minutes after work and to begin sending them again only 30 minutes before the start of a new workday (Koch 2014). In France, there is a new nationwide labor law guaranteeing the right to disconnect; it is intended to force employers to negotiate with their employees about how after-work activities should be handled (Close 2017). The aim is to raise awareness among employees and managers about the right to disconnect and to negotiate best practices, policies, and guidelines for dealing with blurred boundaries.

In a recent study (Stein et al. work-in-progress), we go beyond looking at work/non-work dilemmas to discuss how increasing use of digital technology to facilitate flexible work creates within-work role dilemmas—also known as intra-role conflicts/stressors—for the individual. We have found that the use of digital technology can create a need for interaction between various functions within an organization and hence increase role conflict (Mazmanian et al. 2013). For example, increased use of

digital technologies in a healthcare setting (e.g., EPR system) may force physicians to take on the role of secretary in addition to their primary function. Also a lack of clarity, specificity, and predictability regarding expectations, responsibilities, and performance within a certain role can result in role ambiguity (Peterson et al. 1995; Stamper and Johlke 2003). Workers can also experience role overload if they lack the resources needed (i.e., time available, ability) to live up to multiple role commitments, obligations, and/or requirements (Bolino and Turnley 2005). Such intra-role stressors are important subjects for future research. In short, we are only beginning to grasp the consequences of the digital transformation of work practices.

4 What smart workers and leaders can do

In our study of mobile work practices, we found that workers spend a lot of time making work ‘work’ (Stein et al. 2015). Our empirical results suggest that they can leverage technology in intra-role stress management in a number of ways (Stein et al., work-in-progress). We have seen how they use technology to *configure* entirely new behaviors, such as just-in-time work. Similarly, digital technology can be leveraged to *regulate* negative demands. For example, workers can use functionalities in digital devices (e.g., the traffic light functionality) to communicate conflicting statuses such as “jogging, but available.” We also found that digital technology can be leveraged to *match* available resources with negative demands. For example, a video-based synchronous communication tool can facilitate virtual co-presence and socializing. Finally, we found that digital technology can be leveraged to *synchronize* work among individuals. For example, workers can “sync” their daily scheduling behaviors with others.

It remains to be seen how smart workers and leaders will navigate in the future technology landscape, where digital technology continues to create new opportunities and challenges. Many of the working conditions previously governed by organizational rules or by the technical devices provided by the corporate IT department will increasingly become the responsibility of employees. Most of this effort is invisible in the sense that it is not considered part of primary work tasks, nor measured by KPIs or remunerated. Workers have to find out how best to perform a specific task given the digital technologies at hand. They often lack technical competence and the organization rarely provides any guidelines or official training programs, which means that it is up to the individual to acquire the needed technical know-how (Styhre et al. 2002). Hence, we would argue that the role of leaders lies in combining technical and work-related

skills, in other words in facilitating a better understanding among employees of how to work flexibly by using technology. They can play a key role in providing guidelines and coaching employees in work practices. Besides setting goals and establishing KPIs, leaders also need to design, discuss, evaluate, and provide feedback to employees.

The existing literature also points out that smart work conditions can lead to a sense of remoteness among employees and complicate bonding with colleagues (Dubé and Robey 2008). We found similar patterns in our own study. Furthermore, as smart work conditions become increasingly focused on goal-oriented tasks, and work takes place “anytime, anywhere” (Costas 2013; Mazmanian 2013; Okhuysen et al. 2013; Stein et al. 2015), workers themselves often end up being responsible for bonding with their colleagues and managers. Fiol and O’Connor (2005) refer to this as creating the feeling of togetherness. We would argue that leaders should set social norms and encourage employees to use digital technologies proactively to facilitate online socializing and daily coffee breaks.

Research suggests that workers often equate flexibility and professionalism with being constantly available (Mazmanian 2013; Sewell and Taskin 2015; Wajcman and Rose 2011). In our empirical study of mobile work practices, we discovered that workers actively communicate their availability to peers and leaders. At the same time, they conceal non-work activities such as jogging or grocery shopping during the working day. Overloading and conflict appear to be the result. Instead of questioning whether such demands (e.g., being constantly available), really make any sense, they try to regulate them. We would therefore argue that the role of leaders lies in developing awareness and understanding among flexible workers about what flexibility is and what it is not.

5 Detailed instructions

I would like to conclude this keynote address by encouraging IS scholars to start by investigating persistent research topics and ask relevant research questions. Within our research theme, we are studying a diverse set of topics that can contribute to the IS field and provide useful insight for industry partners².

- Flexible and mobile work (e.g., what are the expectations regarding constant availability?)
- Design of new work practices (e.g., how do we design ICT, physical space, and HR practices to support new ways of working?)
- Crowd work and new models of work (e.g., can we imagine a future crowd workplace in which we would want our children to participate?)
- Lived experiences with digital work (e.g., what does being a digital nomad feel like?)
- People analytics or a data-driven approach to managing people at work (e.g., what are the long-term consequences of being managed by algorithms?)
- Digital transformation of public sector work (e.g., what happens when more decision-making power is delegated to machines?)
- Decent work for the digital worker in the 21st century (e.g., how does technology enable and constrain decent work for the digital worker?)
- Digital transformation of business and management education (e.g., how can the digital transformation of education prepare students (skills, competences, mindsets) to become part of the future digital workforce?)

I would encourage IS scholars to join our efforts in studying the consequences of the digital transformation of work.

Notes

1. CFP in *Organization Studies*: Organizational Control and Surveillance of New Work Practices. CFP in *The Journal of Strategic Information Systems*: Strategic Perspectives on Digital Work and Organizational Transformation. CFP in *Human Relations*: The Science and Practice of Workforce Analytics.
2. <https://www.cbs.dk/en/research/departments-and-centres/department-of-digitalization/research-themes>

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