How to study technology when the nature of work changes

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When we study technology we need to tread the fine line between knowing what technologies we speak about but remain mindful of how we address technology in a social science setting. The decades old debate about how technology influences our work is tightly coupled with how we define the social and material context of our work. Today's knowledge workers rely on digital infrastructures every minute of their work except for probably their lunch break. Meetings are conducted online, computers generate and help edit text, calculate or visualize solutions, and internet protocols transmit anything from video to designs and price information.

We could easily be tempted to think about the digital around us as a thing, a more or less material set of objects that surround us during work: screens, keyboards, pads, phones, cables, signals. The decades old debate around the mutual influence of actions and structures we create, initially termed structuration by Anthony Giddens, has played into how technology can be studied and how humans interact with technology, in structured or network forms, where the idea of Actor Network Theory inspired social scientists. The more recent idea of sociomateriality has influenced our thinking about technology and what it is that we call social.

One of the latest incarnations of this line of thought issues from work by Paul Leonardi and others (Bailey et al., 2022; Leonardi, 2023) and rests on the idea that scholarship focuses on the relation between humans and between humans and non-human actors, such as technology, and that research observes technology in use and in practice surrounding immediate use and usefulness of technology. In Leonardi's words we need to ask how to organise for and think about the materialization of agency (Leonardi, 2023):

"By considering agency as a materialization, we can take a more expanded view. If agency materializes as action, it does so in ways that afford and constrain the very actions that help to materialize it. Thus, when we are talking about affordances, we are always also talking about the materialization of agency. Action knows no distinction among agencies because action is agency made manifest. Agency affords action and action creates agency." (Leonardi, 2023: xvi)

As action (or practice) becomes or remains central in our study of technology and work we may perceive a refreshing departure from a debate or even controversy about what is social and what is not but rather a recognition that some elements and social structures need to be understood or internalised by users (norms and rules for example, see Faulkner and Runde, 2013) and others emerge and are reproduced as enablers and constraints, much alike the old idea of structuration only with a more refined vocabulary for how we think about constraints and affordances and how we co-create reality in the moment of making use of technology.

While the refreshment might not last, my point is to take a step back and consider what the materialization of agency means at work and in context. We should still specify the type of gadget and infrastructure and specific material arrangements we use in space and time and we should zoom into the how and the when of work practices. Such an agenda could help us articulate with more precision how technology supports organizational life and business and how it constrains it. Understanding this interplay could hold a technology fixed, such as generative AI, or it could hold an organizational routine fixed, such as the performance of a specific function. What could be gained from this is fundamental: how do we arrange the human-machine interface so as to achieve a desirable outcome?

The context wherein the human-machine interface takes place or plays out is so varied and that each dimension or factor tends to define its own methodological and theoretical universe in social sciences (Avgerou, 2019). It's no surprise that dipping into contextual conditions and theories is daunting. However, at the same time the following inconclusive list is meant to quench a thirst for theoretical breadth when we observe technology in use and recognise that understanding the duality of technology (Orlikowski, 1992) is just the gate to be opened to a more granular, immediate, existential take on the interface that defines so many aspects of our professional lives.

Changes in work practices include distant and remote work and ties to organizations and employers that are always mediated through apps, screens, or prompts. Offices disappear and re-appear in new formats, mobile, temporary, scrambled. The suggestion is to look beyond the immediate interface between the worker and the screen or the keyboard and consider:

- Time. What was known before interacting with others through an app and what happened during the interaction? Where have they left off, how did the non-human agents react, and what has been learned?
- Space. How does the human worker fit into a space that is an office, a counter, a cockpit or a remote desk? What are the visual cues that accompany the technology in use? Does art play a role in the space that

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is an office? Does movement limit or accelerate the interaction between workers, agents?
- Stakeholders. Who are the new players involved, logged in, eavesdropping? Are regulators closer than ever before, streaming and analyzing transactions in real-time? Are lurkers influencing decisions? Are machines taking remote or subtle signs into account?
- Institutions. Do certain patterns of organizing the interface become common or mandatory? Do norms play into behaviour that seemed irrelevant before certain elements of infrastructure entered common usage?
- Level of analysis. Can we capture or understand collective action through the interface between humans and machines? Are communities and societies changing because novel technology interferes with democracy? Are individual actions at odds with collective action or more easily aligned?

Some of these puzzles may be easier to tackle than others and some theories can apply to multiple questions[2]. The exciting moment comes when theories collapse and new explanations emerge despite or against old ideas. The materialization of agency that allows us and constrains us in co-creating reality happens every day and in diverse settings. It is both easy to study and accessible and fraught with legal and organizational challenges. However, the opportunity to go after the minute, almost banal use of screens, prompts, pings opens the gates to co-creating not just the practice and outcome of work but ourselves as actively forming participants, employees, passengers, patients, hybrid agents.

References

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[2] A few of these themes appear as challenges and research perspectives for scholars who form the Research Group on Collaborative Spaces (RGCS), a welcoming and growing network of researchers who are passionate about contemporary ways of studying space, work, technology, and sustainability: https://rgcs-owee.org/.