

WEEK 15

PHILOSOPHY OF TECH, SOCIOMATERIALITY, AND PRIVACY

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Sociomateriality

Orlikowski, W. J. (2007)

Sociomaterial practices: Exploring technology at work.

This article introduces sociomateriality and *constitutive entanglement* as concepts to build a framework for understanding organizing that addresses the limited insights of the traditional organizational science. The primary ways of dealing with the material realities of organizations are inadequate due to their assumptions of boundaries between humans and technology, the social and the material.

Problematic conceptions

Orlikowski argues that there are two existing strategies for incorporating the materiality of organizations into our studies of them:

1. Ignore or downplay it. This is problematic because organizational practice entails significant material contributions:
 - Visible – bodies, clothes, rooms, chairs, tables, vehicles, phones, computers, utensils
 - Less visible – data networks, water infrastructure, electricity and air systems
2. Focus on specific instances of technology adoption. This, Orlikowski says, generates conceptual difficulties when attempting to generalize:
 - Explicit focus on technology adoption, diffusion, and use as distinct, implying that materiality need only be considered in the moments of technological disruption.
 - These studies also tend to either take a *techno-centric* or *human-centered* perspective. Each of which leave out important context.
 - Techno-centric forgets that technology encodes human values regularly, and this encoding often causes it to not serve people effectively, as intended.
 - Human-centered, by contrast, forgets about the physical functionality of technology altogether.

Constitutive entanglement

Orlikowski offers *constitutive entanglement* as a way to understand the “recursive intertwining of humans and technology in practice”. After acknowledging several frameworks with similar goals, resulting in a cameo from our old friend actor-network theory, she suggests that we give up on treating the social and material spheres as distinct and independent. She recommends the replacement of the conception of materials as “pre-formed substances”, with that of materials as “performed relations”, that we stop seeing organizational practices as “social practices” and start seeing them as “sociomaterial practices”.

Empirical examples

We get two examples of sociomateriality playing out in workplaces to give us an understanding of how we might apply this framework.

Information search

The first example is that of how the modern search engine has changed the way researchers seek scholarly information. Orlikowski contrasts the current practice of searching on Google or Google Scholar with that of visiting libraries, speaking with colleagues, and perusing journals. She states that it’s incomplete to simply state that humans have changed their tools and strategies, because the adoption of Google for this has changed not only the efficiency of the information search process, but of the outcome. She describes in detail the PageRank recommendation algorithm, and outlines how this allows for the featured results to change on a daily basis, resulting in “temporally emergent” results. This system, which consists of **code** produced and maintained by **engineers**, that executes on **computers**, and whose operation depends on **millions of people** creating and maintaining **web pages**, is what Lucy Suchman would call a “sociomaterial assemblage”.

Mobile communication

Orlikowski then outlines the situation at a 33-person private equity firm she’s been studying for an ongoing research project. We learn that in 2000, everyone at the company was given a BlackBerry handheld device, on which they could read and respond to emails in settings away from a desktop computer. She reports on how this drastically changed the cultural expectations for availability, and nearly everyone at the company became reachable at nearly all times. The result of this sociomaterial practice of mobile communication undermined the claimed commitment of the firm to “work-family” balance, by blurring the boundary between on and off the clock.

Concluding thoughts

The premise here seems wholly true, but fairly trivial to myself as someone living in the 2020s. What I wonder about this is what affect this change in framing would have on people doing practical research on organizational systems at the time. Any research happening currently, at least in my field, assumes the inseparability of the social and material, at least implicitly. It would be helpful to have an example of what an earlier researcher would have said about the mobile communication adoption at that company, and what a sociomaterialist would say in contrast.

Leonardi, P. M. (2013)

Theoretical foundations for the study of sociomateriality.

This paper centers around building sociomateriality into a practically useful theory by arguing for a specific theoretical foundation constructed from agential realism augmented by critical realism. Leonardi begins by outlining the emergence of sociomateriality as a compelling lens for organizational systems, prominently featuring Orlikowski's paper.

Sociomateriality and Agential Realism

Leonardi writes that the most common avenue for explaining how phenomena can be simultaneously social and material is through the work of Orlikowski, who is herself inspired by Scientists of Science™ Bruno Latour and Karen Barad. Leonardi outlines the relevant perspectives of these two thinkers.

1. Latour's actor-network theory asserts "there are no inherent differences between the social and the material" and that the distinction scholars tend to make is arbitrary, in order to dismiss some subset of components as "material" and therefore beyond the scope of social theory.
 - No phenomenon can be adequately described unless researchers abandon these artificial distinctions.
2. Barad's central concern is that the "machines" scientists choose to build and implement in order to learn about the world instead intersubjectively construct it. In that construction, scientists and their machines attempt to isolate particular agencies.
 - Object and phenomena don't have intrinsic agency, but scientists narratively grant them agency when they explain the universe as causally mechanized using their equipment and formulae. This skeptical perspective on science as an enterprise is known as agential realism.

Structuration theory

Technology-triggered

We learn about how research on the impact on technology on organizational structure began with contingency theory, which rests on the notion that there is no optimal structure for all contexts, and thus as context changes (due to technology) so does organizational structure. This type of thinking, while compelling on the surface, led to an advocacy for a deterministic understanding of the relationship between technology and structure. This was the prevailing viewpoint until it was challenged by Barley.

- Barley suggests that the implementation of new technology may be occasions during which organizations might re-evaluate their structures.
- Structuration theory says social structures are both a medium and an outcome of human action, and technology impacts social interaction, then the aggregate topology of social interactions changing constitutes a change in structure. This viewpoint comes to be known as *technology-triggered structural change model*.

Adaptive Structuration Theory

Leonardi then brings us to Poole and DeSanctis's Adaptive Structuration Theory (AST). This invocation considers technology to be the modality of structuration. Poole and DeSanctis arrive at this formulation of AST by studying student groups' use of decision support technology to establish decision-making norms.

Duality of Technology and the Practice lens

From there, he introduces Orlikowski's *duality of technology* model, which places technology centrally in the organizing process. Orlikowski says that rather than technology having an organizational effect through communication, technology use itself is the micro-level action from which macro-level structural changes emerge in the aggregate. Leonardi considers this duality framework to be an important waypoint to Orlikowski's *practice lens*, in which patterns of technology use aggregate into "technologies-in-practice," which are institutionalized within organizations.

This framework became the subject of critique for its de-emphasis from the physical or digital properties, in which Orlikowski argues that individuals can "at any moment... 'choose to do otherwise' with the technology at hand". Critics took issue with this view as overly socialized, as it seemed to imply the attributes of the technology itself were irrelevant. It was in responding to these critiques that Orlikowski arrived at the embrace of sociomateriality.

That's too Mutch, man!

From here, we enter Mutch's 2013 critique of sociomateriality and agential realism. While Mutch seems to find the general framework compelling, there are four major concerns.

1. **Lack of unique explanatory power** – Mutch argues that agential realism does not offer unique insights that cannot be obtained through other approaches like actor-network theory or other STS theories. He suggests that these alternative theories can provide similar empirical insights without the dense philosophical origin agential realism.
2. **Operational challenges** – Agential realism's rejection of the subject-object dualism makes it difficult for researchers to engage with empirical data. Mutch cites Wagner, Newell, and Piccoli, who found it challenging to maintain a balanced focus on both the material and social aspects without emphasizing one over the other.
3. **Ignoring temporality** – Mutch criticizes agential realism for ignoring the role of time in producing social structures. He argues that without a temporal dimension, it is difficult to understand how practices emerge, endure, or change over time. This lack of temporal analysis reduces considerations of structure and institution to the practice observed by researchers.
4. **Conflation of social and material** – Agential realism treats all relationships as mutually constitutive, which Mutch argues overlooks how and why phenomena are put into relationship with each other. This conflation makes it difficult to analyze the distinct roles of social and material aspects in organizational practices.

To address these issues, Mutch proposes a philosophical stance that "recognizes the potential existence of a reality beyond our knowledge or conscious existence". This reads to me, as it may to many others, as positivist, but Leonardi dispels this slanderous accusation. He points to Mutch's clarification that we ought to interrogate the "ways in which we endlessly renegotiate our notion of

reality as our language and our life develop”. He covers some ways that critical realism can account for the shortcomings of the agential realist trajectory of the sociomaterialist movement.

- Mutch suggests that critical realism offers a viable alternative by maintaining an ontological separation between the social and the material. This separation allows for a clearer analysis of how these aspects interact and become entangled over time.
- Critical realism includes a theory of temporality, recognizing that structures predate actions and that actions transform structures over time. This approach allows researchers to examine the process of structuration and the role of time in shaping organizational practices.
- Critical realism employs an analytical dualism between structure and action, enabling researchers to analyze them separately while acknowledging their interaction. This dualism helps overcome the conflation problem and provides a more structured approach to studying sociomaterial practices.
- Leonardi adds to Mutch’s argument where it dodges how the sociomaterial is created by bringing together the social and the material. Leonardi says that treating materiality as a structural property and social interaction as occurring in the realm of action, critical realism allows for a more precise operationalization of constructs. Researchers can examine how materiality and social contexts become sociomaterial through the a process that can be compared to that of imbrication.

Privacy

Palen, L., & Dourish, P. (2003)

Unpacking "privacy" for a networked world.

Palen and Dourish's *Unpacking "Privacy" for a Networked World* aims to provide the HCI and CSCW communities with a robust way of thinking about privacy when it comes to technology, which has drastically altered the parameters of how we consider privacy with its creation of a new networked world. They state how technological studies often conflate the many functions of privacy regulation, leading to a failure to provide satisfactory analytical treatment.

They clarify that while concern over tyrannical surveillance looms, many people's immediate privacy priorities regard the interpersonal. These interpersonal privacy concerns were traditionally addressed with physical barriers and social norms. The amorphous nature of audiences in space, modality, and time prevents any impact of these traditional mitigations.

In assessing the ways privacy might be regulated in the networked world, Palen and Dourish apply Altman's privacy theory, which conceptualizes it as a *boundary regulation process*, "where people optimize their accessibility along a spectrum of 'openness' or 'closedness' depending on context." Altman argues that leaning too far toward either end for the context can cause unwanted crowding or isolation.

Boundaries

Palen and Dourish describe three boundaries — or tensions — that are regulated in the process of negotiating privacy.

1. **Disclosure** — The authors discuss how privacy is not solely a matter of avoiding information disclosure, but rather of deliberate selection of personal information to disclose. In the real, physical world, we keep certain things to ourselves but publicize others. These choices for publicity may include publishing our writing or even patronizing a restaurant. The networked world problematizes this act of disclosure by lowering barriers to nonconsensual disclosures. Information could be disclosed via public records or friends' choices of photos to post.
2. **Identity** — There exists a boundary between the self and the other, and that boundary is often allowed to become fuzzy especially in networked settings. One's profession can be used as a grounds to implicate others at the same company or even just in the same field, a reason for extensive guidelines around attaching one's professional credentials to personal activity. This, along with uncertainty of audience for certain technologically aided presentations of self problematize the identity boundary.
3. **Temporal** — The temporal boundary regards how one's approach to privacy may change over time, and disclosure decisions made in the past may not always continue to hold. Technology has an "ability to easily distribute information and make ephemeral information persistent". The authors give the example of converting documents to PDF to avoid modification as one way this boundary may be negotiated in the networked age.

Genres of disclosure

The authors introduce the idea of a *genre* to highlight patterns of privacy management that resolve the moving target of where a privacy boundary lands at any given time. These genres appear in

the consistent nature of disclosure from personal websites and professional profiles, and violations of the genre may occur when disclosed information is used or shared in ways that violate a norm established by the genre.

Case studies

We enter discussion of how these concepts apply in a handful of specific case studies that highlight these problematic boundaries and genres of disclosure.

- **Family intercom** – An attempt to transfer the ubicomp technologies that are popular in the workplace to the family home puts on full display the mismatch between the arrangements of home and work life. The authors amusingly have us imagine how a six-year-old might control “her availability for interaction”, or a sixteen-year-old’s reaction to their sibling’s “passive awareness” of their actions. They also note the different meaning of tasks and communication, noting that summoning a child may be an exercise in power relations, whereas summoning an employee may simply be a communication.
- **Shared calendar** – Calendars that companies use for organizing conference room reservations serve an important purpose both in the realms of publicity and privacy. Whether a room is reserved is intentionally public information. This public information, however, is only intended to be observed individually. Palen and Dourish draw attention to a situation at one company where the aggregate state of the calendar revealed imminent layoffs to employees.
- **Active badges** – We learn about Harper’s research involving the reception to active badges in research facilities. Along with divides between primarily laboratory workers and desk workers, there was also a strong divide between managerial and technical staff. Palen and Dourish attribute this to the notion of the self – technical staff view themselves largely as independent researchers or perhaps small teams, where as managerial staff identify more strongly with the institution. As a result, managers don’t see the technology as much of a threat to their existing sense of self.
- **Mobile phones** – The authors discuss emerging etiquette around mobile phone use in public areas. Paradoxically, it’s easy for one who is not revealing anything to feel invaded by another who is disclosing information to them by virtue of having a conversation with another not-physically-present person in the same physical space. They explain how this furor comes from the overlap between two typically disparate domains – personal conversation and physical presence.
- **Instant messaging** – It seems at the time of authorship, instant messaging platforms largely deleted conversations on a regular basis, maintaining an ephemeral nature to the exchange. The possibility, however, that one could record a conversation introduces tension at the temporal boundary. There is also tension at the disclosure boundary, stemming from the choice of IM over phone call because of the freedom to withhold disclosure to other members of the household that a conversation is taking place. There is also identity boundary tension, as different conversations may have different expectations for identity, or simply prompt different desires regarding what identity is to be adopted.

Nissenbaum, H. (2011)

A contextual approach to privacy online.

A contextual approach to privacy online discusses the current state of online privacy and surveillance, and the failures of dominant policies regarding the ability of individuals to consent to certain types of use and propagation of the information extracted from human populations. Violations of information-sharing are committed both by corporations and human peers populating the same social networks. In these technological settings, the flow of information is constrained only by technological limitations and not by any social, ethical, or political logic.

Transparency and choice

The dominant framework for offering privacy is the *transparency and choice* model, in which a service details their information-flow practices, and a user chooses whether to engage with the service. Nissenbaum states that there is widespread agreement that this framework has failed, although the reasons for this failure are disputed. Some offered reasons are:

- **Take it or leave it** – Offering only accepting all the conditions or abstaining from a service is a weakly instantiated choice. The “opt out” model and the cost of non-use must be considered when deciding whether the choice is truly free.
- **Unrealistic burdens** – Privacy policies are long, abstruse, and legalistic. In the modern age, reading all privacy policies one encounters is a **temporally impossible task**, and even if one did read privacy policies they would almost never understand them. Privacy policies also regularly changed
- **Complexity of technical practices** – If the goal is to accurately communicate how a user’s information is being used and what the outcomes are, it is unachievable. The procedure is so complex only a tiny handful of experts could themselves conceive of it, let alone trully comprehend it.

Critics of this framework who believe nonetheless that a satisfactory system can be achieved through reform, tend to not recognize the final item in this list. That final item leads us into what Nissenbaum calls the *transparency paradox*. This refers to the tension between providing accurate information, and digestible information. Complete information would be incomprehensible, but summarized information would leave out potentially critical details.

Nissenbaum also debunks the idea that a working informed consent model is possible here because it’s accepted in medicine. She argues that the two enterprises can not follow the same model because people actually trust the institution of health care (or did at the time). Doctors are also omitting information when they “inform” a patient, but we accept that because we know as a patient we can’t handle the full extent of the information, and we “believe in the benevolence of institutions of higher learning and ... their mission to promote human welfare.”

In Nissenbaum’s repudiation of the redeemability of transparency and choice, she declares a resistance to the notion that “online” is a distinctive venue, separate from some nebulously defined “IRL”. She also describes online as radically heterogenous, making any one context for protecting privacy insufficient.

Contextual integrity

Nissenbaum offers *contextual integrity* as an alternative framework for online privacy, in which the specifics of the context are considered fully when devising rules for information flow. These rules

can often be taken directly from an analogous offline service, appealing to the norms as well as underlying standards of a typical service when offered in an offline sense. Some of these contexts include

- online banking
- reading the news
- shopping for books
- tax filing
- stock trading.

Nissenbaum considers some situations where there isn't a clear offline analogue, such as a search engine, as some of the more difficult to address with this model. Nonetheless, we could pull information from some of the many offline experiences that a search engine seeks to aggregate. When determining a privacy-protection strategy, Nissenbaum recommends two approaches to cover the possible scenarios:

1. Look for the contours of familiar social activities and structures. If an online activity is a clear transfer from one or more offline activities, look to those offline activities for the norms and standards around privacy.
2. In online cases without straightforward social precedents, start with ends, purposes, and values. From there, work back to norms.