**Scale Matters:**

**Doing Practice-based Studies of Contemporary Digital Phenomena**

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**Introduction**

*“As a practice scholar of contemporary digital phenomena, I feel increasingly challenged to better account for scale. My conceptual toolbox, which has served me well in conducting ‘classic’ workplace studies of technology, has not helped me attend to scale in my practice-based studies of digital phenomena. Should I relinquish this responsibility to those researchers whose tools and methods seem to address scale more naturally or obviously? Or are there ways to develop practice approaches to scale in studies of contemporary digital phenomena?”*

In recent years, we have heard these questions raised by experienced practice researchers and pondered them ourselves. Why and how does scale matter in practice? And relatedly, how should we as practice scholars conceptualize and examine scale in our research?

Contemporary phenomena are digital phenomena, replete with big data, machine learning algorithms, multiple sensors, and distributed cloud platforms. As such, they are complex, dynamic, open-ended, and scalar. It is this last characteristic that is particularly pressing for IS scholarship today, given that our phenomena are increasingly large and widespread, and our conceptual engagement with matters of scale relatively limited to date.

Established ways of handling scale have typically involved adopting a macro focus — studying regional, national, or global phenomena that cut across spatial boundaries through techniques such as surveys, simulations, and trace analyses. These approaches build models and theories to explain phenomena at scale by aggregating and abstracting from specific conditions and experiences on the ground.

While valuable, this is not sufficient. It is not sufficient because examining phenomena *at scale* does not help us understand phenomena *with scale.* The former is an analytical focus, the latter an empirical one. This distinction is related to that made in sociology (Brubaker & Cooper 2000) and geography (MacKinnon 2010; Moore 2008), where researchers differentiate the use of notions as “categories of analysis” (e.g., experience-distant categories developed and used by scientists) from their use as “categories of practice” (e.g., categories of everyday experiences developed and used by ordinary actors).

Most treatments of scale in IS scholarship have been analytical, examining how contemporary digital phenomena *have scale* (focusing on size) and how they operate *at different scales* (focusing on hierarchical levels)*.* These approaches do not capture the lived experience of scale, a condition integral to contemporary digital phenomena (Polykarpou et al. 2020). If we are to effectively study and theorize scale in contemporary digital phenomena, we must expand our approaches to scale — from treating scale only as “naturalized, taken-for-granted categories of analysis” (Kaiser & Nikiforova 2008, p. 538) to also considering scale empirically, as enacted in practice. Such a move recognizes that scale, while it is “real, it is *also* made” (Law & Urry 2004, p. 395; emphasis in original).

This is where IS practice scholars can make a significant contribution — by explicitly and intentionally taking up the empirical matter of scale so as to examine how it is produced and stabilized in everyday digital practices. This requires challenging the concerns raised about the suitability and value of a practice approach to analyzing scale. Such concerns contend that the emerging digital landscape does not lend itself to being investigated with the typical practice approach of immersive, qualitative field studies of single workplaces. As a result, so the argument goes, a practice approach is simply inadequate or even inappropriate for studying contemporary digital phenomena that span multiple, distributed contexts and increasingly involve large platforms and big data. On the contrary, as we argue below, a practice approach has a crucial role to play in offering distinctive insights into how the scale of contemporary digital phenomena is enacted in ongoing practice.

**A Practice Approach to Scale**

A practice approach posits everyday recurrent actions as constitutive of social life (Giddens 1984; Schatzki et al. 2001). We highlight key premises (Feldman & Orlikowski 2011) that are particularly salient in studying contemporary digital phenomena.

***Practices enact phenomena as an ongoing achievement.*** A practice approach posits that the social world is not fixed or homogeneous, but a dynamic and heterogeneous reality that is continually being produced, reproduced, and transformed through everyday practices. Phenomena such as institutions, structures, supply chains, infrastructures, etc., are not givens but ongoing achievements that are recurrently enacted in practice.

***Practices are sociomaterial.*** A practice approach recognizes that practices are not just discursive or cultural, they also manifest in the world as specific materializations. These materializations of practice (e.g., through bodies, devices, data, media, robots, software, etc.) shape the possibilities of what and how phenomena are enacted (Orlikowski & Scott 2014; Scott & Orlikowski 2014).

***Practices enact phenomena in/over time and place.*** Phenomena are enacted in practices that are always situated in specific times and places. As these practices recur repeatedly in many locations, phenomena are enacted over time and across place. A practice approach rejects dualisms such as local-global, viewing these as co-constitutive, with the global being constituted through ongoing and distributed local practices (Barrett et al. 2005).

***Practices are consequential.*** A practice approach views all enactments as producing both intended and unintended consequences. By examining actions on the ground and their resulting enactments, a practice approach calls attention to the emergence of gaps, tensions, contradictions, and disruptions that overflow habitual and normalized performances, generating problematic as well as constructive outcomes.

Building on these premises, a practice approach posits scale as enacted in ongoing practices. Such a perspective has been emerging in the human geography literature, where scholars have proposed that scale is actively produced, contested, and reconstructed through scalar practicesaimed at achieving particular goals (Fraser 2010; Moore, 2008; Papanastasiou 2017). Such enactments of scale may be understood as processes of scalar structuring (Brenner 2001) that recursively (re)produce and transform scale through the choices, negotiations, inscriptions, experiments, and struggles of everyday practice (Moore 2008).

Drawing on Butler’s (1993) performative account, Kaiser & Nikiforova (2008) argue that the recurrence of practices over time constructs, stabilizes, and shifts the scale effects of phenomena. While their account focuses on discursive practices, we consider the reiterative practices that produce the effects of scale to be sociomaterial. For us, scalar practices are always sociomaterial, which in contemporary conditions means that scalar practices entail pervasive digital technologies. And it is their specific materialization through digital technologies that necessarily entangle contemporary digital phenomena with scale.

What do we mean by this? Consider work as an example. The ways in which work is done now — whether in the office or factory, on the farm, or online — is inextricably tied up with many digital configurations entailing various platforms, multiple servers, numerous networks, countless algorithms, and big data (Orlikowski & Scott 2016). Every online search, mobile text, social media post, video meeting, financial transaction, medical diagnosis, product design, and fabrication process implicates actions on the ground with diverse, distributed, and interconnected digital configurations. It is through such recurrent, everyday digital practices that the scale effects of phenomena are constituted over time. This entanglement of digital work with scale — which is mostly invisible, inscrutable, and inaccessible — has far-reaching consequences for what is generated in the near and long term.

From this viewpoint, all contemporary work has scale effects in that its entanglement with digital configurations contributes to their enactment as digitally scaled. We thus need practice-based studies that examine how digital work is entangled with scale through the digital configurations that condition the possibilities of getting that work done.

**A Practice Approach to Scale in the COVID-19 Pandemic**

To highlight the possibilities of a practice-based treatment of scale, we consider the COVID-19 pandemic, generally understood as a large-scale contemporary phenomenon. We examine how the scale of the COVID-19 pandemic is being enacted in multiple, diverse, and ongoing sociomaterial practices that are entangled with distributed and shifting digital configurations. More specifically, we offer four practice-based theses on scale.

***1.*** ***Scale is enacted in ongoing practice***

As the COVID-19 virus emerged and spread around the world, understanding of this infectious disease rapidly shifted from viewing it as a localized epidemic to making sense of it as a world-wide pandemic.[[1]](#footnote-1) As of October 2020, there have been almost 40 million cases and over one million deaths in 215 countries and territories.[[2]](#footnote-2) Knowledge of this pandemic has been and continues to be generated by multiple data collection and simulation activities managed by governments, health authorities, and researchers around the world. Such knowledge has been heavily relied on to monitor the trajectory of the disease and to guide decisions about when and how to intervene so as to reduce viral spread.

While strategies focused on “flattening the curve” varied across the world, what was significant and common to the approaches was the emphasis on using insights from big data and simulation tools to manage responses to the crisis. Over time, it became clear that the recommendations generated by computational models needed situating within specific contexts and activities of social distancing, lockdown, self-isolating, quarantining, and curfew compliance in different locations. This led to a variety of epidemiological approaches and developments of digital infrastructures to support the work of monitoring, testing, treating, tracing, and predicting the spread and containment of the disease in different communities.

The large scale of the COVID-19 pandemic is not a fixed or given state “out there,” but an ongoing sociomaterial enactment produced through recurrent, everyday practices that assess, generate, track, challenge, and transform knowledge and management of the virus, and which in turn, dynamically affect the scale and trajectory of the disease over time and across the world.

***2. Scale is performed through multiple practices in/over time and place***

Management of the crisis varied over time and location as diverse policies responded to projected shapes of curves, which influenced progress on the ground. A range of field experiments in various regions were attempted. For example, Taiwan acted swiftly having learned from previous experience with the SARS virus crisis in the early 2000’s, while Israel similarly transitioned rapidly, reflecting their always-ready state of switching from normal to crisis mode. While these and other countries (e.g., China) were quick to use modelling and contact tracing technologies with lockdown practices, other countries (e.g., South Korea) implemented early testing on a massive scale and used contact tracing technologies aggressively to monitor spread over time. A few countries chose to carry on “as normal” (e.g., Sweden), attempting to produce a controlled spread of COVID-19 viral infection among the population so as to build “herd immunity.”

Initial responses yielded varying results, with some countries seeming to have “crushed the curve,” and others experiencing further spread and escalation. Fears of additional spikes have emerged in some of the countries that had reduced infections (e.g., South Korea and Australia), as new cases emerged following the easing of restrictions. In one response, the UK government instituted “lightning lockdowns” that shift responsibility to local authorities for rapidly triggering and enforcing scaled-down lockdowns as soon as a growing number of cases become evident. The hope is that these avoid the imposition of nation-wide restrictions and avert the economic and social disruptions experienced in earlier, broader lockdowns.

The scale of the COVID-19 pandemic is enacted through multiple practices that are situated in particular times and places. As the pandemic becomes performed differently over time and across locations, conditions on the ground change. The apparently “global” scale of the pandemic is not a pregiven abstraction but an ongoing achievement constituted differently by diverse, recurrent local enactments performed in multiple locations and times.

***3. Scale is a contested, contingent achievement***

The materialization of COVID-19 responses through digital technologies and big data further highlights how scale is not a once-and-done outcome, but an ongoing enactment that entails adaptation, experimentation, and contestation over different political strategies with significant consequences for health, death, and employment. A situation at the Florida Department of Health offers revealing evidence in this regard. In May 2020, the data scientist responsible for the state’s official coronavirus database was fired. Rebekah Jones claims she was dismissed because she refused to comply with orders to manipulate the data so as to justify the state’s ambitious reopening plans.[[3]](#footnote-3) Since being let go, Jones has set up her own data portal to track COVID-19 cases in Florida, and it contrasts starkly with the official statistics. The differences call attention to how contingently data about the coronavirus are being analyzed within the state (and doubtless in other states and regions), underlining the politicization of scaling strategies advocating for different policies with respect to opening and shutting down economic and social activity.

The ongoing uncertainty associated with the pandemic — its spread, treatment, and management — changes daily as more is learned about the multiple trajectories of the disease manifesting over time and place. Such continued precarity shapes people’s everyday practices in dynamically adjusting how they live and work to the changing circumstances of the pandemic. As consequences continue to shift unpredictably, understanding of the pandemic and its scale alters.

What the scale of the COVID-19 pandemic is at any time, is a contested and contingent practical enactment, shifting variously and unpredictably depending on data, computational tools, modeling approaches, response tactics, politics, rhetoric, ethics, and changing conditions on the ground.

***4.*** ***Scale is entangled with sociomaterial practices***

The resurgence of cases following the easing of restrictions emphasized the importance of further testing and tracing to proactively “chase the virus.” Smart phone apps for contact tracing emerged as an important approach to managing viral spread in communities. Initial attempts to deploy contact tracing apps in a number of countries followed a centralized approach with matching occurring on government servers. This elicited much concern over data privacy, and implementation stalled until an unexpected alliance between Google and Apple emerged, promising better privacy through a decentralized method of matching on people’s phones. Further challenges arose when it became evident that the mobile apps are ineffective without follow-up. This entails extensive contact tracing practices that hire, train, and manage hundreds of human tracers to serve as the critical “process boots on the ground” (ImPACT 2020) for identifying infected people and informing those they have been in contact with to immediately self-isolate and monitor symptoms.

Around the world, the COVID-19 pandemic is being variously managed through collecting and analyzing vast amounts of data from various sources, using many different simulation tools to track infection and mortality rates, modeling and predicting likely scenarios, deploying contact tracing apps and processes, testing and treating patients, and implementing policies, procedures, and mandates in multiple locations and times.

The diverse practices being performed across the world in relation to the pandemic are constituted through multiple, distributed, and extensive digital configurations. The large-scale of the COVID-19 pandemic is thus entangled with ongoing sociomaterial practices and the digital configurations in which they are implicated.

**A Practice Approach to Considering Scale in Contemporary Digital Phenomena**

Few would dispute that engaging with scale clearly matters for understanding large and widespread contemporary digital phenomena. But, as the COVID-19 example highlights, scale is often taken for granted in our studies where phenomena are simply assumed to “have scale.” While scale conceptualized in this way may be adequately addressed by macro social science approaches, such approaches cannot shed light on the ongoing production of scale as an empirical phenomenon. To do this, IS practice scholars must challenge claims that scale can only be studied computationally as a macro abstraction, and expand practice approaches so as to examine how the scale of contemporary digital phenomena is recurrently achieved in practice.

Consider a “thought experiment” based on recent lived experience (by many readers) of conferencing practices, such as the 2020 annual meeting of the *Academy of Management* (AOM). Scheduled to take place in Vancouver from August 7-11, 2020, this conference (like so many) went online for the first time in its 84-year history. In a non-pandemic year, this conference would have been enacted through the movement of thousands of bodies from around the world to Vancouver, traveling by planes, trains, buses, cars, etc., and meeting in sessions at the downtown Convention Center and adjoining hotels. Instead, the 2020 conference was enacted through digital work practices entailing thousands of participants connecting from their homes via the AOM virtual site, utilizing multiple computing technologies, videoconferencing software, telecommunications networks, and cloud platforms.

In both cases, the large scale of the AOM is not given but an achievement, enacted through the sociomaterial scalar practices of thousands of members and organizers taking specific action involving multiple infrastructures of transportation, hospitality, presenting, discussing, and teleconferencing. What is different across the cases is how the distinct materializations of the pre-2020 and 2020 conferences changed participation possibilities. For example, the nature of engagement shifted from real-time, in-person sessions with discussion before, during, and after sessions to asynchronous taped sessions and synchronous, virtual sessions, with few opportunities for unplanned interaction. While an on-site conference makes attendance challenging for members who are unable to travel, an online conference limits the engagement of members who do not have access to reliable internet service. The different inclusions and exclusions materialized in the sociomaterial enactments of on-site and online conferences points to the politics implicated in scalar practices (Blakey 2020). Understanding the engagement possibilities as well as environmental and financial implications entailed in different materializations of large-scale conferences requires examining how scale is produced and experienced in practice across times and places. IS practice scholars are uniquely positioned to develop these nuanced conceptualizations of scale and how they matter in practice.

Future work by IS practice researchers studying contemporary digital phenomena in the field can examine how scale is enacted through the entanglement of everyday practices with a myriad of digital configurations (e.g., Facebook, Twitter, Zoom, Google, TripAdvisor to name a few). IS practice researchers can gain insights into these ongoing and situated processes by being attuned to the scalar implications of digital work practices. Such studies would consider the scalar categories and politics that are manifesting in particular local conditions, and how these get (re)produced or changed through processes of scalar structuring involving diverse, distributed, and interconnected digital configurations.

Going forward, we advocate a focus on the relational, practical, and dynamic realities of scale that are critical to explaining contemporary digital phenomena, and which can only be effectively studied through field-based practice approaches. We contend that a practice approach is vital to analyzing scale, and urge IS practice researchers to take on this challenge. If we continue to treat scale as a given “out there,” or as something that cannot be apprehended by practice approaches, then we lose the capacity to understand how scale is enacted and entangled with the digital configurations that shape how we live and work.

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1. The World Health Organization (WHO) defines a pandemic as a serious new illness “occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.”  [↑](#footnote-ref-1)
2. <https://www.worldometers.info/coronavirus/> (retrieved October 17, 2020). [↑](#footnote-ref-2)
3. <https://www.theguardian.com/us-news/2020/aug/12/florida-rebekah-jones-ron-desantis-coronavirus?CMP=share_btn_tw> [↑](#footnote-ref-3)