Information Practices in the Broader 'Deportment' of Mobile Knowledge Work

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ABSTRACT

This paper presents preliminary findings from an in-depth, exploratory study aimed at gathering an understanding of mobile knowledge workers' information practices, which are presumed distinct from those of non-mobile, stationary, centrally located workers. Its focus arises from a need to understand more, from an empirical standpoint, about the information practices of this increasingly visible yet understudied population. Semi-structured interviews with sixteen mobile knowledge workers suggest that this demographic hones distinct but intertwined practices around dealing with information. Five of these are discussed here; together, they compose a broader mobile knowledge work 'deportment' of sorts. Mobile knowledge workers also appear to use bottom-up technological infrastructures to mediate their information practices, ones that are enacted independently of any organization for which they may work. This is discussed as a ripe area for further research. This paper's findings are relevant for advancing research around mobile knowledge work and information practices generally, and for organizations seeking to better support the work of their own mobile employees specifically.

Keywords

human information behavior, information practices, mobile work, mobility, technology.

INTRODUCTION

In recent decades, information and communication technologies (ICTs) have proliferated, playing a role in how, when, and where individuals work. Today, more than one billion people worldwide are estimated to, at some point, conduct work 'mobilely,' with a large percentage of this tied to networked work, online hiring, online freelancing ("elancing"), and independent online entrepreneurship (BusinessWire, 2012). This figure is projected to keep rising (de Carvalho, Ciolfi, & Gray, 2011; Su & Mark, 2008).

Particularly when one is of the knowledge economy, with primary work outputs that are intangible, technology can afford options to work 'anytime, anyplace' and 'go mobile.' (Davis, 2002) Playing off the fact that most knowledge work is not location-dependent; is digital in nature; and is, as a result, untethered, Rainie and Wellman (2012) dub contemporary mobile knowledge workers "bit" workers.

Beyond spatial mobility, global market expansions and recessions have made for a workforce wherein modular and project-based contracts are evermore common (Barley & Kunda, 2006; Schultze & Boland, 2000). A contemporary mobile knowledge worker (or MKW) is thus not only someone who extends and expands (Middleton, 2008) the spaces and times across which he or she works—moving beyond a traditional-office nucleus—but also someone who may juggle any combination of various other organizational, technological, social, cultural, and conceptual mobilities as well. For example, one may be contracted with two or more different organizations simultaneously, contributing components to larger team projects. One of these organizations may be located in another country; one might require special VPN (virtual private network) access and installation of special software; and smaller, piecemeal contracts may be engaged along the way.

As the above scenario suggests, the mobile knowledge work context is dynamic, unpredictable, and problem-driven. At the same time, it is largely autonomous and necessarily improvisational: MKWs lose the structures, resources, conveniences, and fallbacks provided by traditional offices, and fend for themselves, enacting on-the-go solutions in anticipation of and in response to their situations, all while facing persistent risk of connections failing or tools breaking down (Erickson, Jarrahi, Thomson, & Sawyer, 2014). The confluence of these factors suggests that MKWs' information dealings may be complicated in ways that are not adequately captured by existing ideas about well-bounded professional information practices, or "organizational information behaviours" (Huotari & Wilson, 2001). The aim of this paper is to understand how MKWs navigate their unconventional, unstable environments and weave together resources and tools to accomplish their work. Its central research question is: what are the most significant information practices—seen here to compose a broader 'deportment' or

literacy—enabling mobile knowledge workers to overcome contextual challenges and accomplish work?

PREVIOUS LITERATURE

Prior research suggests several general qualities with which mobile knowledge work is imbued; these are discussed below, as is research suggestive of informational dealings and their shape in the mobile knowledge work context.

Mobility

Much of the terminology that surrounds mobile work is fuzzy and inconsistently applied; this is in large part a product of the relative nascency of these issues and concepts. *Mobile* and *nomadic* are two worker types predominantly highlighted across literatures. In general, mobile workers are somewhat abstractly defined as those who extend and expand the places and spaces in which they conduct work, who thus encompass locations beyond traditional organizational nuclei (Middleton, 2008). Abstracter still, nomadic workers are presented as a mobile worker superclass; Chen and Nath (2008), for example, draw the distinction that "a *mobile worker is always a nomadic worker, but a nomadic worker is not necessarily a mobile worker*" (pp. 59-60, original emphasis). Higher levels of mobility or a greater distance from their organizational center(s) tends to set nomads apart—indeed, some researchers (e.g., Czarniawska, 2011; Su & Mark, 2008) have labeled nomadic work as an "extreme form" of mobile work.

On top of this, several other mobile worker-types are often mentioned in scholarly and popular discourse. *Teleworkers* or *telecommuters* may be physically distant from a centralized workplace, but are usually nonetheless stationary throughout a day, setting up a 'home base' in one location in order to perform their tasks (Hilbrecht, Shaw, Johnson, & Andrey, 2008; Liegl, 2014; Middleton, 2008). Individuals who work in satellite offices or with unassigned or reserve-basis seating in their workspaces—*hotellers* and *hot-deskers* (e.g., Hampton, 2014)—make up another type, as do those who operate in near- or total self-driven freelance mode as *offroaders* (Harmer & Pauleen, 2012). In sum, workers who are mobile are not a homogenous group. Collaborating together, they may form *distributed*, *remote*, or *virtual* teams (Hinds & Cramton, 2013; Olson & Olson, 2014).

Initially, we kept little rigidity in our definition of a mobile knowledge worker, or MKW, envisioning an individual who had location-independent work and who was perhaps (not necessarily) mobile along other dimensions as well. Thus, we were inclusive of all above-mentioned non-traditional worker types. Now, however, we specify (perhaps unsurprisingly) that intra-day spatial mobility is a critical indicator of more significantly 'mobile/MKW' information practices.

Despite what may be a confounding or even contradictory vocabulary around our participants (and the different experiences that each subgroup has) there are nevertheless similarities across all. To start, all workers who are mobile risk failsafe connections to and relationships with affiliates and/or clients, relying on (never totally reliable) technological functionality and connectivity as their professional lifelines. Equally important is the overhead "mobilisation work" (Perry, 2007) responsibility all share as they anticipate and plan in advance of daily mobility levels and spatial and temporal shifts, packing and porting all needed resources with them as they move (Rossitto & Eklundh, 2007).

Although "mobilisation work" may ease, it will not absolutely solve, the challenges that mobile professionals face (Knox, O'Doherty, Vurdubakis, & Westrup, 2008; Su & Mark, 2008). These include practical issues like lack of resources or of familiarity with off-site services; corporate invisibility and isolation, and, in turn, a loss of 'social capital' and under-recognition; as well as troubles balancing work and life (IBM, 2005; Koehne, Shih, & Olson, 2012; Olson & Olson, 2014) or even a destabilization of self (Büscher, 2013; D'Mello & Sahay, 2007).

As a further uniting thread, and as the moniker "bit" worker would imply, work conducted mobilely is often specialized and knowledge-intensive, requiring expertise that can leave those performing it more oriented to disparate contracts than to stable work, per se. When this is true, a cognitive 'dexterity' in rapidly transitioning between different employers and clients is needed. The demands of this style of work may too lead to cultivated problem-identification and -solving skill: mobile *knowledge* workers, or MKWs, are most often working convergently, divergently, and creatively (e.g., Reich, 2010; Reinhardt, Schmidt, Sloep, & Drachsler, 2011).

Mobility in general has been extensively researched in recent decades (e.g., Ciolfi & de Carvalho, 2014; Ling & Donner, 2009; Sørensen, 2011). Sociological discussions of mobility, for instance, furnish a theoretical perspective on the obligations and the opportunities that accompany geographic movement (Urry, 2013). It suggests that many individuals "orchestrate new forms of social life around [certain] nodes, for example, stations, hotels, motorways, resorts, airports, leisure complexes, cosmopolitan cities, beaches, galleries, and roadside parks" (Sheller & Urry, 2006, p. 213). Much research into mobile work specifically stems from management studies and the area of computer-supported collaborative work, and investigates how well-defined understandings of space, time, context, and traditional organizational norms are being upended for new, more flexible arrangements instantiated across various mobile work modes, such as those introduced earlier. Erickson, Jarrahi, Thomson, and Sawyer (2014) provide an overview and synthesis of these disparate research strands.

Mobile Information Practices

Within the field of information science itself, a surprising dearth of attention has been paid to mobile work experiences. Allan and Shoard (2005) mention that this gap persists "despite the fact that many more senior managers and professional workers in organizations are now able, through use of technology, to work from remote locations." Further to this, we can already surmise from the challenges inherent in mobile work—lacking tools or Internet connections, or being so isolated—that this context complicates information dealings.

Even though professionals are one of the most well-studied groups (e.g., Julien, Pecoskie, & Reed, 2011), they are so mainly as stationary workers, or at least as ones whose working arrangements can largely be taken for granted. That is, the conditions under which their professional information practices occur are stable, likely to a point of being rendered invisible, and an orchestrated repertoire of "organizational information behaviour" (Huotari & Wilson, 2001) is facilitated across employees. Things like hardware and software and other necessary work tools; standards and policies; and protocols around tasks do not need a second thought, for these are already "set up... [and] designed" to process predictable job demands (Huotari & Wilson, 2001, Introduction). Thus, traditional office workers' information practices are usually seen to follow discernible, perhaps even systematic, rule- based, "programmed," and "verging on ritualistic" (Johnson, 2003) patterns.

Anyone who regularly works 'mobilely' inverts the abovementioned paradigm in many ways. A looser affiliation, higher degree of autonomy, and various compounding mobilities—spatial, temporal, technological, or otherwise—mean that this worker does not and cannot connect to formal organizational resources in the same way as can the workers described by Huotari and Wilson (2001). At the same time, technology is the mediator of all this mobile worker's major information dealings, something that "shapes not only the type, volume, and presentation of available information but also the expectations of the kinds of information that [one] can, should, or will seek" (Courtright, 2007, p. 284).

Mobile devices like smartphones, tablets, and laptops have changed when, where, and how workers deal with their professional matters. They have been found to pass along and forward more information to colleagues than they would if co-located, to make use of 'dead time' to manage information, and to deal with received information outside of normal work hours. In an ever-increasing spiral, such devices may ostensibly ease anxieties of being away from the office, but at the same time "further reinforce a need to be continually contactable" (Allen & Shoard, 2005).

When one's mobility is a permanent working condition, any information intermediary or support staff, like a secretary or records manager, is more than likely absent. Mobile workers therefore often invest in their own information management (e.g., Teevan, Jones, & Bederson, 2006) and take up initiative for their own knowledge management, reading literature, attending meetings, and testing new systems (Davis, 2002).

THEORETICAL FRAMEWORK
This work adopts a practice-driven approach; to date, several studies from the field of information science have explicitly drawn upon practice theory (Huizing & Cavanagh, 2011; Lloyd, 2010; McKenzie, 2003; Savolainen, 2008; Talja & Hansen, 2005). Practice theory uses the lens of routine and habit (Bourdieu, 1990) as a basis in explaining the dynamic social orderings of people, organisms, artifacts, and things (Orlikowski & Scott, 2008; Sundin & Francke,

2009), all while emphasizing the knowledgeability and flexibility of individuals who are situated and acting within very particular local settings (Savolainen, 2008; Suchman, 2007). Words like 'bricolage' and 'tinkering' are often mentioned alongside practice, suggesting that there is certain leeway for adjustment, depending on one's contextual contingencies (Ciborra, 2002).

The idea of *information practice* has been presented as a viable alternative to that of "information behavior"; it is claimed "a more sociologically and contextually oriented line of research" (Lloyd, 2010, p. 23). Practice foregrounds environment and promotes agentic power where behavior is sometimes criticized for seeming to attribute human actions to need-and-response. A practice-informed orientation evokes the ways that people sense(-)make as they draw upon resources around them, assign meanings, and carry out intelligent acts (Nicolini, Gherardi, & Yanow, 2003).

Since gaining momentum in the field, information practices have been conceptualized at varying levels of granularity. On one level, they can refer to people's socially and culturally established ways of seeking, using, and sharing information articles (Davenport, 2013; Savolainen, 2008), thus to concrete manipulations of explicit information sources and artifacts such as would be the subject of inquiry for document or personal information management specialists (e.g., Jones et al., 2015). Information practices have also been cast at broader levels as suites or bundles of activities that bring about individuals' informing, understanding, or literacy in the form of embodied know-how (McKenzie, 2009; Moring & Lloyd, 2013; Nicolini et al., 2003). These latter notions of information practices involve people's engagement with their informational landscapes, and their learning about the nature of information therein (Lloyd, 2010), however explicit or abstract it may be. This quite tacit understanding can be gathered via thought, body, sense, aesthetic, or from social history—for example, one may come to know what is socially acceptable in a specific organization via formal training, on-the-job experience, and through casual conversation.

As an early foray into the mobile knowledge work context, our definition builds mostly from the broader perspective, defining information practices as *sets of activities (together, a 'deportment') that affords individuals the opportunity to make sense of and navigate uncertain, unstable environments, and to assemble and use resources to accomplish work therein.* For a mobile knowledge worker, the result of 'success' in terms of information practices becomes an understanding of how best to carry out work responsibilities across diverse terrain.

METHODS
This study was undertaken with the overarching goal of understanding some of the significant information practices enabling mobile knowledge workers to overcome their day-to-day contextual challenges. It is exploratory in nature; Stebbins (2001) writes that "researchers explore when they have little or no scientific knowledge about the group, process, activity, or situation they want to examine but nevertheless have reason to believe it contains elements worth discovering" (p. 6).

Here, sixteen MKWs compose the sample of participants from whom data was collected, via in-depth, semi-structured interviews. Our open-ended interview protocol centered on eliciting a detailed picture of the professional fields, responsibilities, arrangements, and work spaces of MKWs; their professional tools and material infrastructures—documents, devices, applications, systems, and otherwise; and their strategies and tactics for dealing with work challenges. We offered no pre-set definition of 'information' to our participants, and asked questions that spanned a spectrum of concrete, physical items and abstract, tacit literacies. Interviews ranged in length from 50 to 90 minutes; all were audio recorded and transcribed.

Our inclusion criteria required that those recruited for this study keep a permanent address within the larger Research Triangle area of North Carolina, and have at least a spatial, geographic mobility component as part of their professional work (perhaps alongside other 'mobilities'), for example, with required travel, by utilizing co-working spaces, or by spending work days travelling between client sites.

At the study's outset, sampling followed a purposive strategy; later, we turned to snowball and theoretical sampling (as we aimed to interview more individuals with high, 'nomadic'-like mobility). Our pool of sixteen participants includes individuals who span different lines of work and who vary across job positions, age, and gender. Table 1, above, shows demographic details. Our goal at this stage was not to ensure data saturation, but rather to begin piecing together salient informational points for this population. However, our later interviewees did not identify new themes for us.

Data collection and analysis proceeded concurrently, with transcripts imported to NVivo research software. The orienting ideas of information practices and ICTs offered some direction to our independent and collaborative analysis efforts. Open codes and initial memos identified ideas and issues for follow-up, iteratively refined (per Maxwell, 2005, pp. 63-66) as focused codes and integrative memos.

FINDINGS

Presented below are descriptive accounts of five information practices. These proved particularly salient across the group of MKWs we interviewed, and are summarized in Table 2. We do not intend for our five practices to be hard and fast, mutually exclusive containers for MKWs' information dealings; there is much overlap and much symbiosis between them. It is also necessary to disclaim that these practices may not, in and of themselves, be unique to mobile workers. An important takeaway from this study has certainly been that MKWs adroitly, as second-nature, combine information practices that are evermore common for all types of workers, a phenomenon indicative of the shift overtaking contemporary work. We rather argue that the sum of these practices—a broader deportment—is what distinguishes skillful, literate MKW ways of working on the whole.

		Role (Arrangement)	Work Space(s)
P1	F	instructor (O)	co-working space
P2	F	web developer (SE)	home office
P3	F	strategy consultant (O)	multiple 'offices'
P4	M	knowledge manager (O)	home office
P5	M	web developer (SE)	co-working space
P6	M	columnist (O)	home office
P7	F	business consultant (SE)	multiple 'offices,' client sites
P8	M	IT consultant (O)	in transit, client sites
P9	M	corporate trainer (SE)	multiple 'offices'
P10	M	lawyer (O)	multiple 'offices'
P11	M	IT developer/ consultant (O)	multiple 'offices,' client sites
P12	M	IT consultant (O)	multiple 'offices,' client sites
P13	M	web developer (O)	home office
P14	M	realtor (O)	in transit
P15	M	IT support (O)	multiple 'offices,' client sites
P16	F	realtor (O)	in transit

Table 1. Participant demographics.
(O=larger organization; SE=self-employed).

Information Practice	Explanation
Ensuring Information Availability	Knowing how to/being able to access documents, files, and communications 'any time, any place.'
Maintaining Technological Acuity	Knowing how to/being able to work within and around the capabilities/constraints of one's tools, remaining a viable worker.
Keeping Social Cohesion	Knowing how to/being able to maintain professional presence when working remotely, via virtual and physical means.
Upholding Work Rhythm	Knowing how to/being able to exploit local environments so to conduct work as seamlessly as possible despite unpredictability.
Enacting Personal/ Professional Balance	Knowing how to/being able to manage where, when, and how to integrate/segment home and work spheres.

Table 2. Mobile knowledge work information practices.

In line with this study's theoretical underpinnings and inductive approach, we understood information practices to be holistic and subjective. Each of the five practice types mentioned below in some way revolves around tangible information objects, information as documents, artifacts, or "things" (Buckland, 1991), but is itself more process- than product-oriented.

Ensuring Information Availability

MKWs' unpredictable working arrangements lead to their seeking assurance that they will be able to overcome whatever on-the-ground, in-the-moment situations may affect their access to information. Through "mobilisation work"—which Perry (2007) explains "does not ask what is the work of the nomadic [or mobile] worker, but what is the work that is required to make such work possible" (p. 1)—our MKWs planned in advance around known 'blackout' periods whenever possible. If internet, intranet, or cloud-storage connections would certainly be lost, MKWs might download networked documents to offline drives or print relevant papers (as a last resort), making sure they have at hand what they need.

The majority of those interviewed, however, had the habit of digitizing all newly received and even sometimes all past, archived information. This activity fed their need for accessibility and availability of information, as well as a need for portability of this information. P11 stated, "I want to remain mobile, so I would prefer a pdf. I want to have [a document] on my computer or a phone; I don't even own a printer at home." This latter sentiment was echoed throughout our interviews. Our MKWs also valued convenience, something that was definitely afforded when they could ensure a singular technological access point to their multitude of resources, be this a device or a cloud solution. The confluence of these three factors—accessibility, portability, and convenience—led several former paper-handlers to scan every working document on an ongoing basis. One avid scanner further emphasized the (convenient) ease of memory this activity offered: "I'd rather do it and then I have [any information] with me. I don't have to remember to carry around a file folder, I can keep it on here and always have it" (P2).

Another crucial, convenient advantage of digitizing was searchability, and hence speedy information access during fast-paced, changeable work situations. As P4 stated, "I've found that the need to search and retrieve stuff has kind of made the scales tip more in the favor of doing it digitally." And, to fend off obstacles to information availability while still maintaining the outward facade of a 'seamless' professional was another reason that MKWs began to scan pages: "Because I'm so reliant on technology, it's easier to find my phone than it is a pen and piece of paper," stated P14, speaking to convenience. He continued, "You know, another thing is, in terms of professionalism, to me, walking around with a piece of paper and a pen scribbling down notes can be a little unclean."

Considerations of space do not allow us to explore further the dimensions of time and long-term experience in this nor the other information practices we identified, though our participants did imply their mobile 'learning curves.' Activities like digitizing were skills honed as they became more literate and learned in mobile careers. As mentioned, many were previously entirely paper-based, but found this to hamper their efficiency. P7 explained that her move to an all-digitized stance occurred over time, as she made sense of the ins and outs of her work arrangement.

Maintaining Technological Acuity

Closely related to mobile workers' need to understand how technologies can be fashioned to keep information sources accessible and available for use across all manner of work scenarios is a need to stay current with and to be able to troubleshoot disconnects among devices. Any of desktops, laptops, tablets, or mobile phones might serve as a worktop for an MKW at any given moment, and all might embed their own constraints, from limited battery life to being an unrecognized tool on a secure network. Equally, when perfect one-to-one correspondence between devices is lacking, MKWs face even more obstacles to work productivity. Erickson and colleagues (2014) argue that MKWs' technical acuity is a crux of their professional knowledge, as understanding how to use technologies is vital for both their independent and collaborative work.

What might seem mere mundane, logistical trivia about points like device battery life and power splitting were actually some of the most precious pieces of knowledge put into daily action by our MKWs, getting them through any issues. Our participants knew to double, triple, and even quadruple the number of mobile phone chargers and docks that they carried around with them, some even investing in expensive multi-purpose ones as security. The lightest, still high-powered back-up laptop battery was another investment participants were glad to have made when they faced long workdays or unexpected flight delays and long layovers. Precise hours of battery life were memorized, and chargers were placed strategically. P3 tells, "for my phone, I actually take 4 types of chargers: […] always one permanently in my car, and there's one permanently at my daughter's, and permanently in my house. And it lasts a day and a half, the battery." Himself a real estate agent always on-the-go, P14 noted "devastating" consequences of not being nimble with regard to charging.

MKWs' need to understand the connective capabilities of local brick-and-mortar establishments is a major component in their work; this is discussed further as their practice of 'Upholding Work Rhythm,' below. However, a competency regarding just how their devices would react to these services—especially when one was the only proximal gateway to a needed piece of information—was a matter of their technological acuity. Airport and coffee shop WiFi networks were scouted as potential candidates for use by MKWs who did not have professional concerns about

security or speed and bandwidth. P5 knew that, should his home internet fail, he could "drive down to the McDonald's or the Subway […] and just work there." Others knew that neither the information they handled nor the devices and servers to which they required access would even allow for unsecure café connections; for them, knowledge of how to enable mobile phone hotspots and the ability to ration data bytes appropriately were required. P10 and P11 are two participants who shared that "there are companies where you know you shouldn't log on. […] Public WiFi is notoriously insecure" (P11).

More stationary MKWs also had a number of trial-and-error technological work-arounds that helped them to bridge what boundaries or "roadblocks" (P14) surrounded their work. These boundaries often arose when dealing with a larger organization, and devised ways of overcoming them may be routine or improvisational and on-the-spot. For example, P4 is an employee of a larger corporation who finds that inadequate and over-secured resources have been grandfathered into his mobile-work set-up without managerial foresight. He finds it necessary to work with a personal computer in addition to his work computer: "I can't do half the things I need to do on my work computer, 'cause it's restricted and locked down […] I can't function without both of 'em […] I spend so much time trying to work around the system" (P4). To download a file *requiring* editing with software only found on his home computer, the same participant learned that he had to burn a disk "because they don't allow flash drives on our work computers […] it shuts down as soon as I stick a flash drive in." To print documents, he knows to email them to his personal address and override security pop-ups before using his personal printer.

Keeping Social Cohesion
Being a mobile worker means having some degree of distance from a centralized organizational locus. This translates to the absence of informal mechanisms for 'keeping in touch' with others such as cubicle chats, cafeteria discussions, or participating in impromptu team meetings. The detachment and independence involved in mobile work can also leave one lacking a handle on what nuances of an organization would make gaining feedback, maintaining motivation, and developing and exploiting 'social capital' easier. P11 mentioned that since being mobile, "I definitely have noticed that I get, like… left out of the loop." Keeping up with external connections was critical for MKWs, whether employed by larger organizations or running their own businesses. They used tools with the dual purpose of gathering information with which to solidify professional networks and of outputting information that presented them as viable colleagues, collaborators, or contractors.

MKWs with more independence in their work arrangements were often putting together ad-hoc, temporary teams driven by the needs of their current contracts and projects. Knowing the right people and upholding the right relationships with this extended network of skilled experts is key.

Interestingly, this sort of team assembling will lead to even more modularity within mobile working arrangements. P5 explained it thusly: "if I need somebody to do a graphic design, then I will get a graphic designer to do that, and I will pay them for their time, and then I will get the product and that's the end of the relationship. […] If I need somebody to do the HTML CSS for a site, then I have a friend that actually has his own business and I will pay him for that. And then I get the work, he gets the money, and we're done there. You know, it's almost like… we've moved to this 'every-man-for-himself'-type thing."

Social networking tools like LinkedIn and even Twitter were conduits for making successful working groups come together; P2 described her monitoring and ongoing 'reach' to others via the sites as to "my amoeba network. I've got a bunch of like-minded people with expertise in different areas." The MKWs in our study who held more stable affiliations with organizations upheld awareness of office goings-ons via the same sites and informal emails, going out of their ways to show personal as well as professional interest in others. Being apart from the centralized office and work performed there similarly complicated interpersonal etiquette for simple issues; in such cases, technologies 'stepped in'—P12 reported the new informal policy of using Lync to alert remote coworkers before logging in to limited-seat company software following someone's accidental 'booting off,' for example.

Conscious of precariousness in their distanced positions, MKWs strategically combined virtual interactions with face-to-face information exchanges, traveling to corporate offices as they saw necessary in order to remain visible. P6 explained reasoning behind an upcoming cross-national move that will position him closer to a home-base office: "The first people to go are the people like me, people in remote offices. It [will] give me a chance to sort of be more of a presence in their office, and to make myself better known to them, and possibly position me for the next thing." He continued, "it's a thin stream of communication to do things in a chat room or [over] email or Twitter. It's very, 'lo-band,' and sometimes you need 'hi-band'" (P6).   P8 and P10 agreed, each of them paying monthly fees to rent physical offices for 'seamless' client meetings.

Virtual spaces were the first-stop augmenters of physical ones, however. The same social media sites as facilitated MKWs' scoping and gathering of information about others were "important resources for sustaining work by letting others know where one [was], even without planning to meet them there" (Liegl, 2014, p. 14). Our MKWs promoted their skill, expertise, and work ethic with carefully crafted updates on the web. P2 took care to make sure she was seen as an "expert" and as someone who "only works with experts" on her LinkedIn "resume," and updated it "every time something launches, [because] I'll put a screenshot of it up there."

This managing of one's own image and of *how* one was visible proved a major activity for our MKWs, mobile work creating the "dynamic where your digital self is now your

social, personal self" (P8). Our MKWs learned to use the means at their disposal to 'speak' to the specific audiences they wanted to reach, employing different outlets to these different ends. As their typical first encounters with others all came online, much attention was given to email inboxes and corporate IM systems throughout the day. Still, at times, virtual features were used in the opposite way, as means of further separating or removing oneself from social contact. P4 explains of his conference calls, "if I didn't have the mute button I would be in trouble, 'cause I'll do everything from feeding the cats to doing chores around the house."

Upholding Work Rhythm
Driving, flying, and crossing national and international boundaries are part and parcel of mobile working arrangements, and disrupt both time and space. So often on the go, our MKWs learned to exploit their local environments in aid of conducting their work as seamlessly and efficiently as possible (Vertesi, 2014). Difficulties brought by constant traversing are addressed in part by becoming familiar with the lay of different times and spaces, and with what tasks, infrastructure, or amenities are possible or available within them.

The MKWs we interviewed were careful about connecting otherwise 'dead time' to core work activities; the significant amount of time they spent moving about through airports, in cars, or between meetings necessitated this. A majority mentioned always holding conference calls while driving, as well as taking advantage of voice-memo features on their mobile phones. "I'll say, 'Siri, set a reminder for such and such,' you know. 'Put a reminder in here.' 'Siri, make a calendar appointment for such and such for this day,'" P7 described, technologies performing for her at moments when her own hands could not. P3 stated outright, "if I didn't have a voice recorder, life would be very difficult. Because I'm so mobile, voice is critical to me." Having at their disposal a tool like voice-memos, that could 'keep up' with their high levels of movement, was critical. P6 noted, "that's the main reason I use Google Voice—[it] chases me and records." Equally, when this information was later needed, it was "fast at [their] fingertips" (P6).

Similarly, while in the air, many of our MKWs would prepare emails to send once on the ground: "I'll use that time […] even though [messages] can't send until I land, I'll write everything I need to, attach everything I need to, do whatever I have to, and then have them ready to send as soon as I connect to WiFi again" (P7). For others, experimentation led to discoveries such as iMessage still working during flights, or to non-refreshed, pre-loaded browser pages remaining alive even while flying. Upholding the rhythm of workdays meant "maximizing" any and all time (P9) with such in situ mobilization work.

Our MKWs also knew that taking advantage of immediate spatial surroundings and offerings (when able) was key in overcoming barriers to work. As mentioned above, MKWs knew the neighborhood spots and coffee chains where they would be able to connect to WiFi. For example, P14 mentioned that "you figure out which place you can pull up in the parking lot, jump off the WiFi versus places where you might have to go in"; he preferred Burger King parking lots for "hitting the WiFi" while transitting.

Simple things like electrical outlets were also coveted to the end of upholding work rhythm. Years of experience led P9 to carry an electrical splitter with him at all times, but this was because he knew that "finding a table near a plug is hard […] when I'm in an airport or in a Starbucks." Likewise, all our MKWs knew the ambiance they required to be productive, and were unromantic about their need to "create [their] own private space" (P4) when out in public, usually by way of headphones. Sometimes, it was worth fronting an extra cost for the assurance of being able to work better across diverse spaces; P9 declared, "I actually pay to be an Admiral Club Member. When I have long layovers in airports, I can go in and have a big area to sit and WiFi and everything else—it's better."

Enacting Personal-Professional Balance
MKWs live with fluidity between traditionally distinct times and spaces, making another major challenge they face that of blurred boundaries between personal and professional spheres. When work structures around other time zones, this is especially so, as hours become "kind of nebulous" (P12). Participants may then not be striving to uphold their work rhythm, but rather feeling some degree of guilt over wishing to unplug. P13 explained that his work "is a lot of playing with time zones," and that he has "to be available for someone to ask me a question, or if I've asked for [another's] feedback, it really kind of sucks if I'm not there to receive it." Creating and enforcing separation between home and work was a responsibility falling to individuals, and our MKWs learned where, when, and how to integrate and segment these parts of their lives. Equally, they were aware that there is no straightforward formula for doing so. "We kind of integrate technology to our lives, which you could either see as never stopping working, or you can see as… managing our time more fluidly" for "greater sanity," explained P6.

'Fending for oneself' as an independent employee tended to lead to a heightened monitoring of work information during off-times for our MKWs, and to a reactive feeling that they always had to be available to serve clients. P9 elaborated, "my family would tell you I work all the time, because I own the business and the business is me." In many ways, this ability to work at any time, with flexibility, was appreciated. Spousal illness made P10 a full-time worker, parent, and caregiver for a months-long stretch, for example, y et he "didn't really have to change anything. I didn't have to go to the office and grab a bunch of files, because I already had access" to all the information he required in place.

While technology was in many ways the enabler of an 'always on' mentality among our MKWs, it was also the resolution to this; knowing when to sign off and quit work each day was one of the most significant sensibilities that

our MKWs obtained as they spent more time working mobilely. "It's a parameter I had to learn being a mobile worker," P7 mentioned, while P3 aptly stated, "it used to be that I came home and I was unplugged. Then, I had to make a conscious effort to go to get plugged in. Now, you have to make a conscious effort to unplug." Others drew distinctions between 'on' and 'off' by using separate technological equipment for their personal or professional tasks, as "it helps me work more, it helps me focus more, you know it just makes that barrier" (P12). Thus, a mobile 'discipline' comes with experience and trained willingness to "let things just be in their proper place at their proper time" (P7).

DISCUSSION

MKWs hold different relationships to professional information resources and infrastructures than do more stationary employees. Their distinctive work arrangements lead to increased challenges and potential for 'breakdowns.' However, adopting certain information practices makes the daily obstacles they face more navigable. In this paper, we identified five such practices, all entwining in a stance that suggests how MWKs understand their relationships to and across diverse organizations, times, spaces, cultures, and technologies. Our MKWs go to great lengths to configure and reconfigure multiple information resources and tools in particular ways, ensuring their abilities to accomplish work outside of traditional, conventional offices. Gaining access to information while on the move, being adaptive and dexterous with technology, staying in contact, cultivating momentum, and juggling work-life demands all require MKWs' local instantiations of practice.

Much prior research about professional workers' information dealings continues to proceed from an "organizational information behaviour" (Huotari & Wilson, 2001) perspective, essentially a top-down model of planning, forecasting, and scripting the information and information systems used throughout employees' work. Ingenuity and creativity on the part of individual workers still enters, of course, but maneuvers within a much more bounded, less flexible area of action. Mobile workers, on the other hand, have greater degrees of distance from this centralized model, literally and figuratively, and they continually, autonomously, enact on-the-ground responses to the information-related scenarios they encounter.

The present study illuminates two salient features of the mobile knowledge work context that will be developed further in future work. The first is that of the "articulation work" (Strauss, 1988) or "mobilisation work" (Perry, 2007) that it entails; the second is the idea of 'emergent' infrastructure that it encourages.

First, MKWs' honed information practices are in large part scaffolding, or extra work they must carry out, in order to accomplish their core work tasks across times and spaces. This "articulation" (Strauss, 1988) and "mobilisation" work (Perry, 2007) is necessary before 'real' work can take place. For MKWs, it involves cultivation of "right configurations of people, resources, knowledge, and place" (Bardram & Bossen, 2005, p. 136), despite any number of unforeseeable circumstances or contingencies. As a unit of analysis, 'information practice' effectively accommodates articulation and "mobilisation," being in many ways itself about learned, strategic, and tactical ways of producing action.

Second, MKWs' information practices have an inseparable material aspect, near-entirely mediated by technology. Technologies make possible their access to documents and to clients and collaborators, for example. By leveraging these artifacts and their concomitant knowledge base, MKWs are able to be productive, successful, and viable in what they do. A practice-centric view gives a useful means of delineating technology's supporting role in social activities (e.g., Orlikowski & Scott, 2008).Talja and Hansen (2005, p. 126) note: "the social practice approach sees a mutually shaping relationship between information and collaboration practices and the tools developed for purposes of communication and knowledge sharing." Taking this one step further, we see that the technologies undergirding MKWs' information practices are often individualized assemblages, ones 'emerging' as "pull"-based (Hagel & Brown, 2008), "inverse" (Egyedi & Mehos, 2012), and "generative" (Tilson, Lyytinen, & Sorenson, 2010) answers to situational professional needs—perhaps a need to work around corporate firewalls or to keep up steady battery life, for example. That is, these technological assemblages have emerged *in practice*, as "user-driven, self-organized, bottom-up developments with decentralized control" (Egyedi, Mehos, & Vree, 2009, p. 3). Neither designed nor built in centralized settings, MKWs' 'emergent' infrastructures are inherently—intentionally—incomplete, open, and adaptable to dynamic information dealings.

We plan to carry forward these two research trajectories, holding interviews with more mobile knowledge workers, and emphasizing recruitment of those with high levels of intra-day spatial mobility. We also plan to use participant-generated digital research diaries to gather data that is closer to mobile knowledge workers' in-the-moment information activities. The present study has supplied a foundation for this and other future work, as it begins to extend what is known about mobile work; adds to existing research an 'informational' level of detail; and begins to expand how professional information practices—and their shape in the contemporary workforce—are conceptualized.

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