



# Mobility of knowledge work and affordances of digital technologies



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## ABSTRACT

The focus of this work arises from two needs within information science literature: (1) to understand more, from an empirically driven perspective, about the increasingly visible yet understudied mobile work population, and (2) to address more clearly, from a theoretical standpoint, the ways in which information and communication technologies (ICTs) mediate the work practices of these mobile workers. Drawing on the affordance perspective, this research goes beyond simplistic conceptualizations of technological effects to explore the roles of multiple ICTs in enabling mobile knowledge work. In this paper, the use of ICTs in mobilizing information practices and the ways in which ICTs generate affordances along different mobility dimensions (spatial, temporal, contextual, and social) are examined. The empirical base of this research is a field of study of 33 mobile knowledge workers (MKWs); broadly, it focuses on the ways they employ ICTs to accomplish work in dynamic and unpredictable work conditions.

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## 1. Introduction & related literature

As of 2012, more than one billion individuals worldwide were considered mobile workers, a figure that includes 75 percent of those employed in the US, Canada, and Latin America (BusinessWire, 2012). Information and communication technologies (ICTs) play no small part in the continued rise of this population (Ciolfi & de Carvalho, 2014; Su & Mark, 2008), affording them the opportunity to work 'anytime, anyplace' (Davis, 2002) and assisting in their connectivity across locales, far beyond the traditional, centralized office nucleus. How mobile knowledge workers (MKWs)—those who not only extend and expand (Middleton, 2008) the spaces, times, organizations, and projects across which they work by choice and by requirement—employ ICTs to accomplish work in dynamic and unpredictable conditions is the focus of this paper.

The mobile knowledge work context is distinct from the "small world" (Huotari & Chatman, 2002) organizational model often discussed in the information science literature. First, many MKWs have no centralized organization of which to speak, but 'orbit' around clients and colleagues and through an extended professional network (Costas, 2013; Czarniawska, 2014). For them, an upper management has not supplied and dictated the specific use of such things as hardware, software, systems, applications, standards, and policies (Huotari & Wilson, 2001). Rather, MKWs face

a persistent reality of mobility across spaces, times, organizations, projects, and other borders; their work tools must be able to withstand this and to work independently of a centralized system or structure, since intra-company virtual access or even standard connectivity may, at any time, become unexpectedly unavailable (Su & Mark, 2008). This requires technological capability to be sure, but also adept 'mobilization work' on the parts of MKWs themselves (Perry & Brodie, 2006b), which involves extra activities and planning for spatial mobility and temporal shifts. It is the premise of this and several of our other papers to date that the complexities and contingencies inherent in the mobile work context have yet to be adequately dealt with in the information science field (Thomson & Jarrahi, 2014; Thomson & Jarrahi, 2015; Jarrahi & Thomson, 2016).

Information science scholars interested in information practices have made professionals in traditional work arrangements a common population for their studies (e.g., Courtright, 2007; Julien, Pecoskie, & Reed, 2011). Their investigations have furnished valuable insights about the patterns of acquiring, seeking, chaining, using, and retaining information materials discernible within several venerable fields, including engineering, science, healthcare, law, as well as other areas of academia (e.g., Allen, Wilson, Norman, & Knight, 2008; Leckie, Pettigrew, & Sylvain, 1996). As Veinot (2007) points out, these are all prototypical knowledge professions that stress the cognitive, analytical, creative, and problem-solving capabilities of those who carry them out. The need for site-specific resources or time-specific functionality is very rarely present for knowledge workers (e.g., Davis, 2002), and an ever-expanding suite of ICT features enables their mobility even more so.

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A few information science scholars have pointed out a weak theorization of ICTs in information practices research, particularly professional information practices research (Allen, Karanasios, & Slavova, 2011; Järvelin & Ingwersen, 2004). Sawyer and Huang (2007), following Orlikowski and Iacono (2001), discussed five conceptualizations of ICTs found across information science and information systems literatures. In one view, the most commonly taken approach to ICTs and the one preferred in the *Journal of the Association of Information Science & Technology (JASIST)* publications about 40 percent more frequently than in *Information Systems Research* publications (Sawyer & Huang, 2007), is where ICTs are relatively unproblematized. They are depicted as tools with various identifiable features that operate wholly in line with their design to produce certain effects and impacts. In their analysis of literature, Sawyer and Huang (2007) also found 58 percent of *JASIST* publications do not engage ICTs beyond the artifact level. They argue, as we do here, that there is value in strengthening our understanding how information, technology, and people interrelate.

Along the same line, the nascent research on the context of mobile work is heavily weighted to the direct effects of technologies in creating location independence, providing instant information retrieval and faster data processing, and reducing the cost associated with mobile work (e.g., Mori, Paternò, & Santoro, 2003; Wang, Van de Kar, & Meijer, 2005). Thus, the sociotechnical context of mobile work, and the specific needs and practices of MKWs, are not adequately problematized. In addition, much of this research is focused on the integration of single technologies in mobile practices (e.g., cell phones or cloud services) (e.g., Karanasios & Allen, 2014; Perry, 2007) even though other studies of different types of work (e.g., Jarrahi & Sawyer, 2015), and especially mobile work (e.g., Rossitto, Bogdan, & Severinson-Eklundh, 2014), suggest that a vast majority of knowledge workers are increasingly employing a suite of devices, tools, and technologies in their daily work practices.

The affordance and sociotechnical perspectives adopted here offer one way to address these issues. Mobile knowledge work is an especially interesting context in which to consider problematization of the interplay between ICTs and information practices because the triadic interdependencies between mobility, knowledge work information practices, and digital technologies are so exposed here. This brief setting of the scene has shown that mobile knowledge work is not, as of yet, a mainstream research consideration and technology is not, as of yet, adequately scrutinized as a mediating player and constitutive factor in human practices. This research adds to discussions of the interplay among information practices, the multiplicity of ICTs, and the mobility of knowledge work, which are at present scant. Mobile knowledge work is a newly emergent phenomenon, idiosyncratic, and still very much in its formative stages. However, it is only increasing in visibility. Exploring the technological habits and information needs and practices of MKWs presents implications for technological and organizational design, and offers insight into the trends that are driving contemporary workforce change more broadly.

Design and implementation of new information systems has to take into account the unique ways through which MKWs manage and incorporate information and knowledge in their mobile practices (Erickson, Jarrahi, Thomson, & Sawyer, 2014; Sørensen, 2011). MKWs embark on extra activities, and generate specific “understanding” and “literacy” to deal with their uncertain and unpredictable work environment, and to assemble a functioning “mobile office.” (Bardram & Bossen, 2005; Perry & Brodie, 2006a). In doing so, they continuously generate and draw upon explicit and implicit forms of knowledge to be able to navigate and settle multiple work spaces (Erickson & Jarrahi, 2016; Perry, 2007). As a result, organizational information and knowledge management practices must now accommodate the particularities of remote and mobile

work arrangements that increasingly become the new normal in many organizational settings.

## 2. Theoretical framework

James Gibson (1977), a perceptual psychologist, suggested that when interacting with their environment, animals and people do not perceive an object independently of its uses, and dubbed this a perception of utility “affordance.” The meanings that people assign to objects therefore originate from their subjective ideas of what these are good for. Even though objects and their features may be the same across users, affordance perceptions are likely to vary. That is, affordances are experienced in unique ways, depending on how a given social actor interprets objects in light of his or her particular situation and context. In his formulation, Gibson makes an interesting distinction between the materiality of an artifact and the affordance of an artifact. Whereas material properties refer to features such as the distinctive colors, textures, or shapes of objects that are encountered by all users in the same way, the affordances of objects may be multiple. Use of the same technology by different actors can thus result in multiple outcomes, such that a technology’s affordance refers to what its material properties may actually achieve for a given individual (Markus & Silver, 2008).

Social practices shape the affordances of technology (Orlikowski & Scott, 2008); at the same time, the affordances of a technology can be defined based on the social practice(s) it enables. Sociomaterial practices are considered spaces within which people engage with the materiality of technological artifacts to produce various outcomes (Orlikowski & Scott, 2008). This moves affordances beyond the exclusive property of either a social actor or a given technology, toward something that is constituted in the relationship between people and the material artifacts with which they come in contact through a set of social practices (Hutchby, 2001).

In order to capture the affordances of different digital technologies, it is essential to focus on the social practices that they enable. Features of technologies are “materialized” only if their use by MKWs is consequential in how these workers carry out their information and work practices. There is a diverse set of practices that undergird the work and personal lives of MKWs; however, common to all of them is the mobilization work or mobilizing information practices that enable MKWs to shape their understanding about solutions to problems related to working across multiple places (Perry, 2007).

By employing the affordance perspective and focusing on the common information practices of MKWs, this paper describes how the use of various ICT genres enables MKWs to generate different affordances and outcomes, mobilizing their impact beyond the traditional, centralized office space.

## 3. Methodology

Our sample consisted of 33 mobile knowledge workers mostly from North Carolina’s Research Triangle. Data was gathered through in-depth, semi-structured interviews with all participants and the additional collection of research diaries from 12 of the same participants. Participants were chosen for inclusion based on three criteria: their engagement in knowledge work; mobility in their work; and centrality of nomadic practices to their work. As mentioned, knowledge work involves the creation or transmission of knowledge; is intellectual and creative; requires both theoretical and technical knowledge; and requires a formal education (Schultze, 2000).

Participants were identified through purposive sampling of possible contacts developed from our engagement with community-based freelance and entrepreneurial groups in North

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