Information Work in Information Science Research and Practice

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ABSTRACT
Information science and technology researchers and practitioners discuss information activities a broad range of terms. A concept that often appears in colloquial discussions of information activities but that has received less systematic attention is that of information work. This panel gathers a group of information science researchers who have explicitly used the notion of information work in their research to discuss how the concept can inform information science and technology research, and practice.

Keywords
information work, information, work, concepts

INTRODUCTION
Information science and technology researchers and practitioners discuss information activities frequently in terms of activities, practices, behavior and tasks. A concept that often appears in colloquial discussions of information activities but that has received less systematic attention is that of information work even if work is a recurring context of information research and it is a central concept in many adjacent fields from organization studies to sociology and management.

The aim of this panel is gather a group of information science researchers who have explicitly used the notion of information work in their research to discuss how the concept can inform information science and technology research, and practice. Instead of making a claim of the need for yet another information concept, the panel takes a critical look at earlier research and engages panelists in a debate to question the usefulness and added value of the concept and by practical examples to demonstrate why and how it has been useful (or unnecessary) in their work. The panel discusses explicitly 1) if the concept of information work is necessary and if yes, how it can contribute to the better understanding of information activities, 2) how it relates to other information concepts, and 3) what practical implications the notion of information work can have in information science and technology research and practice.

The outcomes of the panel is to give the audience, both researchers and practitioners, and participants alike a better understanding of the concept of information work and its implications in pushing forward the state-of-the-art in information science research and practice. At the same time the panel proposes different ways of how to fruitfully combine information and work research for a better understanding of the both phenomena.

INFORMATION WORK
The conceptualizations of information work vary in the literature. It is possible to delineate two main approaches to the concept: information work as the principal work of a group of (information) professionals (e.g. Kuhlthau, 2005; Durrani, 2008) and information work as a part of the work of everyman (e.g. Hill, 1999; Huvila, 2013), and within the latter, three more conceptualizations: technology-oriented

references to information (technology) work, information-centric approaches that emphasize the role of information and the often colloquial uses of information work (and related terms such as e-Work) to refer to information intensive branches of work (e.g. library, information and communication technologies, archives) (Huvila, 2009). Within these broad approaches, there are many differences and in general, there is no clear consensus of definitions.

In information technology contexts, information work has been used to refer to information (technology) work (e.g. Hempel, 2004; Medina-Mora et al. 1992). Palmer et al. (2007) have used information work in an abstract meaning "as a general term to refer to information practices at any of these levels of granularity". Blandford and Attfield (2010) write about information work in roughly similar terms as work pertaining to information.

Huvila uses the term to refer to the information component of human activity. He argues, "all work has an information component and presumes some degree of information processing whether the work is manual labor or highly abstract decision making" (Huvila, 2009). In information-intensive contexts such as libraries, archives, and museums, information work can be the primary activity. More often, however, information work is a secondary activity that supports the principal activity and provides a framework for explicating the generative informational mechanisms of work. Information work is infrastructural, and in a sense, similar "sub-work" (Huvila, 2009) as the notion of "computing work" discussed by Gasser (1986).

Lloyd (2011) has discussed information work in the context of workplace information literacy practice, arguing that modern workplaces, are characterized by new versions of work, rapid rates of change, seamless integration of technology and the ability to work virtually and without propinquity. As the workplace is recast to include new versions of work, primacy must also be given to information work as an important form of labor. *Information work* emerges as part of workplace practice, as work that connects people with the complex social structures of the workplace and the information modalities and ecologies that support them. The way information work is operationalized will depend on the way information and knowledge are understood by the domain. This in turn will influence information literacy and literacies of information that become legitimized. Consequently, understanding the nature of information work has implications for information literacy educators who are involved in preparing students for transition into the workplace.

Palmer's research on interdisciplinary information work has been based on foundations in the sociology of work, established by Anselm Strauss and others (Strauss, Fagerhaugh, and Suczek, & Wiener, 1985; Fujimura, 1987) and following Gerson (1983), who acknowledges that the "handling and processing of information is part of the task structure of every kind of work." Palmer has applied the

concept across a range of studies of scholarly and scientific information, and in a 2008 ARIST chapter, "Scholarship and Disciplinary Practices" (Palmer & Cragin, 2008) relates the analytical perspective to the broader turn to studies of practice in information science and the social sciences, more generally.

An overview of the earlier references to information work give an impression of a diversity of how the concept has been used in the literature, but also of the theoretical and practical underpinnings of writing about information "work". In spite of the differences in perspectives, it possible to discern connections between the approaches. There tends to be discernible, either explicit or implicit, reasons to why information activity is characterized in particular contexts in terms of work. A closer look at how different studies of scholarly information behavior and (information) work have been framed by their authors provide some insights into their, to a certain extent, diverging scopes and foci (e.g. Ford & Foster, 2003; Palmer & Cragin, 2008; Veinot, 2007). Similarly, many of the approaches have their theoretical and practical foundations in empirical work(place) studies, sociology and anthropology of work (e.g. Strauss, 1985), or in related work-concepts such as mediation work (Baker, 2005), articulation work (Schmidt & Bannon, 1992) or computing work (Gasser, 1986). However, it is apparent that a better understanding of the differences between specific conceptualizations and their links to other information concepts is needed to critically scrutinize them and their usefulness in scholarship and professional practice. Budd's (2002) work to elaborate the epistemological differences between information and knowledge work as a part of a broader pursuit towards clarifying the epistemological premises of librarianship and information science is a step to that direction but it is apparent that much more information work (sic!) is needed to broaden our understanding of the concept.

LAYOUT OF THE PANEL
The panel starts with a short presentation by the moderator that introduces the term information work and presents a short overview of its use in the literature and initial remarks of its relation to other information concepts to the audience. After the introduction, all panelists give a lightning talk of how they have used the concept information work in their work in different areas of information science research with a specific focus on the theoretical and practical benefits, implications and shortcomings of the approach in the context of the specific study. After the lightning talks, each of the panelist are asked to present short commentary on colleagues' presentations with a focus on pointing out commonalities and differences in the approaches and the relation of the different takes on information work to other information concepts. After the commentaries the panelists are asked to give short, one minute reflections of how and in which area of research or practice they would push the state-of-the-art of information work in the field of

information science. During the final part of the panel, the audience is asked to join the discussion with panelists on information work, the use and usefulness of the concept in information science and technology research. The discussion is led by the moderator and facilitated by a set of questions based on the panelists' presentations. The panel closes with an invitation from the moderator to contribute to the discussion started at the panel and a short round of proposals and ideas for future work on information work from the panelists and the audience.

The presentations follow a double trajectory of exploring the use and usefulness of the notion of information work in different areas of IS research (including information behavior and practices, scholarly communication, workplace studies, information literacy and knowledge organization), and the relation and complementarities of the notion to other information concepts (including information behavior, information practices, information activities, information literacy) in different areas of IS research.

PANELISTS AND THEIR CONTRIBUTIONS

Isto Huvila, Uppsala University
Isto Huvila discusses the concept of information work in the context of his previous and on-going research of museum and archaeology professionals, their information practices and the interlinking of the practices to the information infrastructures (including knowledge organization systems) used as a part of their (information) work. The presentation shows how the notion has been useful in practice in conceptualizing information activities of professionals as related to each other and to their work, and how the conceptualization of information work as a sub-work links to notions of work, tasks, work roles and infrastructures.

Professor Isto Huvila holds the chair in library and information science at the Department of ALM (Archival Studies, Library and Information Science and Museums and Cultural Heritage Studies) at Uppsala University in Sweden and is adjunct professor (docent) in information management at Information Studies, Åbo Akademi University in Turku, Finland. His primary areas of research include information and knowledge management, information work, knowledge organization, documentation, and social and participatory information practices. The contexts of his research ranges from archaeology and cultural heritage, archives, libraries and museums to health information and e-health, social media, virtual worlds and corporate and public organizations. Huvila has given numerous invited talks and published broadly on the topics ranging from information work management, archaeological information management, social media, virtual reality information issues to archival studies and museum informatics, ancient history and archaeology.

John Budd, University of Missouri
John Budd will explore potential definitions and theory of information, especially as these affect the practice of information work in library and other agency settings. Particular attention will be paid to the creation of information and mediation work.

John Budd is professor emeritus at the School of Information Science & Learning Technologies, University of Missouri and the author of a dozen books and more than 100 journal articles. Much of his work focuses on the academic setting, and includes the economics of information products and scholarly communication. These efforts also include the politics of higher education and of academic libraries. He is also interested in information literacy and the role it plays in student success. Much of his writing is grounded in the philosophical school of thought of phenomenology and the ways this philosophy can inform information work.

Annemaree Lloyd, University of Borås
Professor Lloyd will will explore the concept of information work, drawing from previous research with firefighters and nurses into the enactment of information literacy. The presentation will explore how the concept emerges in the workplace, considering information work as one of the hidden strategies of workplace information literacy practice.

Annemaree Lloyd is a Professor at the Swedish School of Library and Information Science, University of Borås, Sweden and an adjunct Professor in the School of Information Studies at Charles Sturt University Australia. Her primary research interest lies at the intersection between information, learning and practice. Professor Lloyd is engaged with theoretical and empirical work associated with the development of information practice, information literacy theory and landscape methodology. In the workplace sector, Professor Lloyd's research explores the information experience of learning working practice and performance. In the health information field, Professor Lloyd is engaged in interdisciplinary research which explores nurses' workplace learning; she also investigates health literacy in relation to refugee knowledge construction and the health information practices of people with chronic illness. In the area of refugee and forced migration studies, Professor Lloyd's research focuses on the impact of information practice on social inclusion. Recent research explores the learning practices of refugee youth in everyday spaces. The concept of fractured landscape research is also being explored in relation to information practices in connection to the transition and resettlement practices of refugees.

Carole Palmer, University of Washington
Palmer draws on her previous applications of "articulation work"—the planning, organizing, evaluating, negotiating, adjusting, coordinating, and integrating activities involved in getting work done—to boundary-crossing information

work in interdisciplinary science and scholarship. In particular, she relates how her earlier conception of "weak information work," based on studies of high impact information in neuroscience (Palmer, 2006; Palmer, Cragin, & Hogan, 2007), can inform development of data curation services in libraries and data centers, arguing that information support services should be shifted away from strong, routine activities to the more speculative and potentially higher impact activities.

Carole Palmer is Professor and Associate Dean for Research in the Information School, and affiliate faculty of the eScience Institute, at the University of Washington. Her work focuses on data curation and digital research collections for interdisciplinary science and scholarship. Her current research examines how to optimize the reuse value of data and develop rich, functional cross-disciplinary data collections. Palmer has been a leader in professional workforce development in data curation for nearly a decade and serves in a number of national advisory roles, including on the Technical Advisory Board of the Research Data Alliance, the steering committee for the National Data Service, and has been a member of two National Academy of Sciences study committees on data curation and cyberinfrastructure. Before joining the Information School at the University of Washington in 2014, she was Director of the Center for Informatics Research in Science & Scholarship in the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign.

Elaine Toms, University of Sheffield
Toms examines information work at the micro level -- the nature of human activity at the task and sub-task levels when people engage in an activity using systems and resources to support personal and/or work goals. In line with Frederick Taylor's question with respect to the automotive industry: "what is the best way to do this job?", she asks the same question of information work which is primarily work in head, cognitive activity that is mostly externally invisible and unobservable, yet complex, multi-faceted, and longitudinal. In her work with a group of environmental managers, Toms deconstructed their information work into a set of tasks and subtasks. Notably, there are few tools to support their completion. She poses the question, what sorts of *cognitive prostheses* do we need to enable the user to do their jobs (i.e., information work) efficiently and effectively?

Elaine Toms is Professor of Information Innovation & Management at the Sheffield University Management School, UK (with previous appointments in Sheffield's iSchool, and Dalhousie University and the University of Toronto in Canada). Understanding why information-rich systems fail users and exploring how systems need to be optimized for human use has been the focus of her research spanning the boundary of the computer interface. This has involved understanding how people work and use information and systems in their work, as well as evaluating novel tools to facilitate access to and use of information.

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