# Documenting Work:
# From Participant Observation to Participant Tracing

**Carsten Østerlund, Jaime Snyder, Steve Sawyer, Sarika Sharma, Matt Willis**

**Abstract.** This paper explores the methodological aspects of studying distributed work by focusing on the more tangible aspects of this work, namely documents. We show how 1) researchers should engage in an initial mapping of documents before starting to track them; 2) the ongoing flow of virtual organizing only becomes apparent by triangulating the digital flow of documents, observation of tangible documents (e.g., paper) and repeated behavioral inquiries; 3), documents supporting distributed organizing do not serve as stable information artifacts, but rather become snapshots in time, part of the general flow of work across numerous documents and applications. We evaluate how best to combine document tracking with interviews and participant observation, and discuss the challenges and benefits associated with digital instrumentation, practicality, privacy, and the production of knowledge.

## Introduction

Distributed work is hard to observe. A focus on the more tangible aspects of this work, namely documents, provides a useful lens into the work practices of organizational members in general, and those working in heterogeneous and distributed environments in particular. Imagine the distributed collaboration going into the production of this book involving many research teams distributed across the globe, the publishers and the editors. The individual chapters have taken form first by circulating among coauthors and then reviewers and editors to finally end up at the publisher. Multiple databases, organizing schemes, email servers and cloud-based systems have been part of this process as documents have flowed among distributed participants.

Conceptually, a document can serve as a lens into the socio-material nature of what organizational members do, day in and day out. We view documents as artifacts that reflect social, material, temporal and spatially structured communicative practices invoked in response to recurrent situations (Lund, 2009; Buckland 1997; Frohmann, 2009; Briet, 2006; Zacklad, 2006; Østerlund 2008; Østerlund and Boland 2009). Analytically, one can approach documents not only as standalone artifacts characterized by specific content, form, participants, time and place, but also traces of ongoing work practices. By tracking documents over time, follow their changes, movements and uses we can depict the unfolding of work. As in a time-lapse photo document traces make organizational behaviors come alive. Studying documents in work allows us to position people's immediate activities and situated routines in their larger social and organizational context. As documents carry institutional structures and point to both past and future activities they open a window to larger organizational practices.

Recently, scholars have argued that, "documents are not simply instruments of bureaucratic organizations, but rather are constitutive of bureaucratic rules, ideologies, knowledge, practices, subjectivities, objects, outcomes, and even the organizations themselves" (Hull 2012, p. 253). The focus of many current approaches to document studies is not solely on texts as semiotic constructions abstracted from their material vessels (i.e., concentrating primarily on the content of documents) but has expanded to examine dynamic processes and activities in which documents play a role. For example, scholars have examined the relations among documenting *practices* (Brown and Duguid 1994; Harper 1998; Knorr Cetina 1999; Latour 1987; Latour and Woolgar 1986; Randall et al 2007)), document *materiality* (Barad 2003; Orlikowski 2007; Suchman 2007), *infrastructures* (Hine 2006; Ribes, 2014; Star and Ruhelder 1996), *genres* (Bazerman 1995; Orlikowski and Yates 1994; Østerlund 2007; Swales 1990; Yates and Orlikowski 2007), the *physical organization* of the document (Feldman 2008), and documents as *boundary objects* (Bechky, 2006; Carlile 2004; Star and Griesemer 1989)) This requires us to look at, rather than through documents, as things that translate, transform, modify or distort the meanings or things they are supposed to convey (Latour 2005).

**Studying Documenting Work**

Recognizing the conceptual relationship between documenting work and distributed organizational work practices gives rise to a methodological question: How do we best study documenting work? The answer may seem tantalizingly straightforward. You collect the artifacts left behind as organizational members go about their work and then begin to dig through your stack to look for evidence of work practices. But if you consult your qualitative methods books for guidance as you undertake this task, you will be reminded that documents subsist as a lower caste in field research as "the most despised of ethnographic objects" (Latour 1990, p. 54). Method texts (not counting history and political science) often devote significant attention to helping the reader refine their interview and participant observation skills, while documents and other artifacts are often addressed in passing under headlines such as "secondary sources" or "unobtrusive techniques," if at all.

Many an ethnographer has gathered piles and piles of documents in the field with the best of intentions, yet without a robust understanding of the larger body of documents from which they are drawn or the technical infrastructure supporting them. More importantly, this type of gathering obscures the traces documents leave of organizational members' unfolding work practices, their documenting work. In other words, focusing not only on documents but the traces that are left by documenting practices, especially in digital environments, provides an opportunity for new integrative strategies to track work practices in distributed environments. The studies summarized in Table 1 illustrate how such traces lead to innovative approaches for understanding phenomena such as distributed science collaborations, conflict handling in crowdsourced environments and the unruly life of electronic medical records in modern healthcare.

As seen in these studies, examining document traces challenges the ways in which we think about the location or field of action for an ethnographic study. Traditionally, ethnographers seek a physical site that is shared by actors and can provide a rich interactional environment for participant observation (Ribes 2014). A reliance on co-location is not viable in distributed organizations. Many interactions are neither co-located nor synchronous. There is not a single site from which to conduct observations.

| **Reference** | **Research Context** | **How Innovation Was Used** | **Outcomes/results of Innovation** |
|---|---|---|---|
| Sawyer, S., Kazianus, E., and Østerlund, C. (2012). "Social Scientists and Cyberinfrastructure: Insights from a Document Perspective." CSCW 2012, February 11–15, 2012, Seattle, Washington. | Science collaborations | Combines document tracking, participant observation and interviews to study distributed collaborations among social scientists | Demonstrates the shortcomings of contemporary cyberinfrastructure in the support of distributed social science collaborations. |
| Østerlund, C., Sawyer, S. and Kazianus, E. (2011) "Studying Technologically Dense Environments through Documentary Practices." 27th Conference of the European Group for Organizational Studies, 6-9 July, Gotenborg, Sweden. URL: | Science collaborations | Combines document tracking, participant observation and interviews to study distributed collaborations among social scientists | Details the method and evaluates how best to combine document tracking with interviews and participant observation, and discuss the challenges and benefits associated with digital instrumentation, practicality, privacy, verifiability and reliability. |
| Geiger, S. and D. Ribes. 2011. "Trace Ethnography: Following coordination through documentary practices." in *The 44nd Annual Hawaii International Conference on System Science (HICSS-44)*. Hawaii, HI: IEEE Computer Society Press. | Wikipedia | Combines the richness of participant-observation with the wealth of data in logs to reconstruct patterns and practices in a distributed organization | Detail the blocking of a vandal in Wikipedia involving many different editors with many different software tools and mechanisms to coordinate their work |
| Østerlund, C., (2008). "Documents in Place: Demarcating Places for Collaboration in Healthcare Settings." *Computer Supported Cooperative Work (CSCW)*. 17 (2), 195-225. | Healthcare | Traces medical record production and use through document tracking, participant observation and interviews. | Illustrates how doctors carefully craft their medical histories in various electronic record systems to demarcate specific places for coordination with specific collaborators. Such documents serve as portable places, allowing doctors to navigate a constantly changing landscape of relevant patients, participants, times, and spaces. |

*Table 1: Use of Document-centric Participant Tracing in Qualitative Research Methods*

Anne Beaulieu (2010) advances the concept of co-presence as an alternative to co-location. For workers, co-presence might be established in numerous ways, co-location being

just one among others such as email exchanges, phone conferences, activity logs for repositories such as Dropbox, threaded exchanges on discussion boards, or changes in folder structures in a shared database. These traces also serve as data for researchers interested in coordination and collaboration activities (see Table 1). While such traces of organizational behaviors might be regarded as thin data compared to the thick descriptions produced by classic ethnographers (Geertz, 1973), they reflect the same types of co-presence many actors themselves live in their distributed and online organizations. In this sense, the researcher and the actors are in symmetrical positions. In Ribes words: "actors and ethnographers both relied on thin data to go about their 'thick activities' – though for different purposes" (Ribes 2014, p. 2). Similarly, Metiu & Fayard's (2015) ask in this volume how we can produce thick descriptions based on thin online texts. In their rich discussion the problem is framed as one between text and context. Co-located researchers and participants often have immediate access to the context of their activities. Without co-location, online participants and researchers have to discern context from texts left behind.

In this chapter, we present our own approach to working with document traces as evidence of organizational practices in distributed collaborations. Our approach to data collection builds on the basic assumption that documents are central elements of organizational infrastructure and provides evidence of unfolding coordination over time. Figure 1 summarizes our document-centric data gathering strategy. The two light colored boxes represent mapping activities and the darker colored boxes show tracking activities.

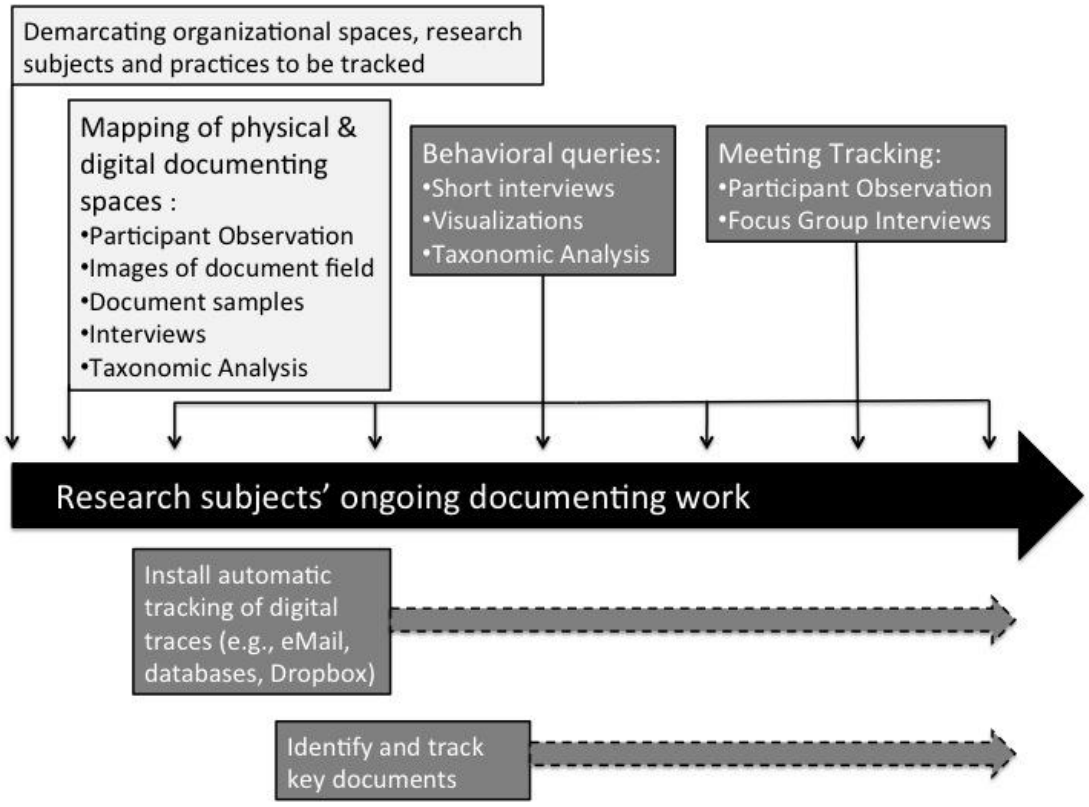

*Figure 1: Document-centric data gathering strategy*

**Mapping the field of documents**. Document mapping is framed by two overarching questions: Where do your documents live? How do they support your work practices? Pursuing these questions is done in a phased approach. We begin with initial interviews with key informants to help bound the study by determining, for instance, the number of relevant participants, organizational goals and structure, spaces, temporal rhythm and tools. At this time, we ask them to complete a brief survey to gather details about tools used for document production, sharing or storing. Second, we spend a day or two with key informants to detail their document arrangements across both physical and digital spaces. We ask the informants to guide us through their physical and electronic document spaces, which may take the researcher from unwieldy piles of papers stacked on an office floor to neatly structured desktop file folders and bulky email inboxes. This phase of data collection includes participant observation, interviews, document sampling, and taxonomic probes. Photos of the physical space and screen shots of file directories and other aspects of the informant's digital environment serve as helpful tools for capturing data.

We follow these broad questions with focused inquiries into specific documents associated with particular work practices of interest. For example, lists constitute the oldest form of records (Goody 1997) and the foundation for the most advanced forms of documentation in the form of databases (Hull 2012, p. 262). Together with taxonomies, they also serve as particularly helpful data in the mapping phase of this methodology. Lists of pending tasks found on a whiteboard or carefully maintained folders and subfolders in an email program or repository speak volumes about participants' core activities and how those are organized into subsets and the way they are related to the whole. This allows us to map the relationships among the various sub-repositories and their relationship to the larger whole (Spradley, 1979, 1980). These analyses are central to an emergent qualitative understanding of the participants' distributed work, but more importantly a necessary step in setting up the technical infrastructure that will allow us to track traces of unfolding documenting practices.

For instance, mapping distributed collaboration among scientists has revealed that most project teams created a shared repository, yet participants rarely synchronized their personal classification and storage schemes for paper or electronic documents (Sawyer et al 2012; Østerlund et al 2011). Taxonomies vary greatly across collaborators. On one science project, graduate student Liz had 12 sub-folders in her electronic project file. Senior faculty member Caroline had only two. Email folders seemed to be less organized than file folders and came with fewer subfolders if any. To complicate matters, some participants used email folders as prime storage devices for documents. One senior faculty member consistently went to his deleted mail or sent mail folders to retrieve old documents associated with distributed collaborations. Similarly, several other scientists we have spoken with reported slowly giving up on folders to organize documents, relying more and more on search functions to retrieve project documents on their desktop, email and shared repositories.

**Tracking the process of documenting work**. After initial interviews and exploratory observations of participants' work environments, tracking the process of documenting work revolves around four data gathering techniques. First, we set up a system for automated gathering of digital traces. Software tools provide a range of choices from simply tracking changes in specific folders (e.g., https://www.dropbox.com/) to using screen recording software such as Camtasia Studio (Ignatova and Brinkman 2007; Tang, Liu, Muller, and Drews 2006). For shared repositories, change logs permit us to follow the flow of documents and to see who contributes to what documents, when and where. Individual electronic desktops and email offer more of a challenge due to heterogeneous technologies, organization schemes applied by each participant and privacy concerns. Depending on an individual scholar's organizational habits and setup, we can install an email tracking application and/or file tracking software on an informant's primary computer, with logs saved to a secure online repository. We analyze these digital traces for process cycles and other major events. For instance, when do people tend to work on the project? How does content flow among collaborators? How quickly do they respond to other's inquires or postings? What division of labor do we find among the participants?

Tracking scientists' documenting work revealed that in many cases shared repositories quickly become dead zones (Sawyer et al 2012; Østerlund et al 2011). Documents go in, occasionally but rarely come back out. In most cases no clear taxonomy emerges in these shared repositories and nobody takes responsibility for keeping up an organizing scheme. Instead participants maintained their own filing systems and shared documents via email. One senior faculty member provides a notable exception to this pattern. She tends to be the driver for many of her distributed projects, which she conducts via email and a blackboard learning management site. She maintains a clear file structure for project documents and collaborators rely on her to push the project forward and keep documents organized.

Second, through the ongoing analysis of digital and behavioral traces we identify a small number of key documents that play a central role in the scholars' coordination activities. These could be heavily distributed email attachments, frequently edited PowerPoint decks, or documents highlighted by informants in interviews. We track these documents in detail and analyze how they evolve through different iterations. Content and document level analysis reveal how key documents relate to other artifacts and events.

For example, to-do-lists emerged as a key document in science collaborations (Sawyer et al 2012; Østerlund et al 2011). Often merely lists outlining activities to be accomplished by the group or specific members, these summaries represent both the discussions and reflections that have gone into their production and they outline pending future activities. The materiality of these lists often repeatedly changes. They might start out on a whiteboard, be captured on a cell phone photo, shared via email, be transferred to a word documents or end up on project tools like Omnifocus or Basecamp.

Third, we track the participants' activities through behavioral inquiries. Short phone calls to individual participants become targeted interviews around key documents or project events. Specific documents or visualizations of document flows serve as interview prompts. For instance, automated tracking of email allows us to visualize the rhythm of email exchanges among collaborators. Such visualizations may lead to interesting conversations about project management, division of labor, temporal rhythms of work, etc.

Tracking and inquiring about to-do-lists, for instance, reveal that operational leadership appears to be closely tied to the person producing those documents. For many collaborations one or more graduate students would produce and circulate to-do-lists following email discussions or teleconferences. These correspondences prompt the rest of the team to engage in specific activities. However, close to major deadlines the production and circulation of to-do-list tend to shift to senior faculty members, only to return to the graduate student after the article or proposal had been submitted.

Our fourth and last data collection strategy is more closely related to traditional participant observation. Collaborators tend to organize teleconferences or face-to-face meetings to discuss the progress of their distributed collaboration. These regular gatherings offer excellent opportunities to build rapport through informal interaction and focus group interviews. Participating in these meetings can, to some extent, substitute for the individual focused behavioral inquires and enable us to contextualize the use of particular documents or triangulate insights gained from the document tracking or individual behavioral inquiries.

**Methodological Implications**

Placing documents and the practices associated with them at the center of our qualitative methodology comes with clear benefits, but also new challenges. Table 1 summarizes insights gleaned from our study of distributed work among science teams.

| Implications | Comments |
|---|---|
| From participant observation to participant tracing | Participant tracing allows researchers to study documents as processes or practices with temporal, spatial, and material manifestations that change over time. |
| Digital instrumentation | Software tools allow researchers to track a range of document activities, if carefully selected and implemented. |
| Committment | Many document-tracking strategies require the research subjects' active engagement. |
| Privacy | Monitoring people's physical and electronic documents brings the researcher in proximity with highly private information. Enabling the subjects to control monitoring parameters and review data before released to the researcher protects subjects' privacy. |
| Heightened awareness | A document centric methodology increases the research subjects' awareness of their own documenting work and can influence practices, if only temporarily. |

*Table 2: Methodological Implications*

**From participant observation to participant tracking**. Traditional participant observation involves co-located observing and interviewing, with rich ethnographic descriptions

emerging from deep immersion. Studying the flow of documents requires the collection and intermediate analysis of larger bodies of documents before a complete picture of work practices can begin to emerge. We refer to this as *participant tracking*. Through this tracking, information gathered during interviews and observations becomes helpful in elaborating the dynamics of how documents reflect work practices and are linked to situated contexts. A hermeneutic approach supports the tracking of documents by organizing observations into short repeated cycles of data gathering and analysis. The researcher performs an initial mapping of the document field followed by automated tracking and repeated behavioral queries (i.e., iterative mappings). Analyzing the change logs along with collected and tracked documents in preparation for each behavioral query and participant meeting becomes necessary if one wants to illuminate the ongoing flow. Not only does this allow the researchers to refine their tracking techniques and time their mapping to important events and places for collaboration, it also makes it possible to triangulate document based observations through interviews, participant observation and new document analysis.

Participant tracking positions documents as not as stable artifacts but rather as dynamic processes with temporal, spatial, and material manifestations. For instance, tracking the specific location of documents in a physical pile or whether a document could be found in the office or workbag offers insights to the unfolding coordination of the group. Does an informant bother to print and file a document received as an email attachment or is it digitally shuttled into an email folder to be forgotten? Does another informant insist on printing out all documents only to lug them around in a brief case or allow them to be buried on a cluttered desktop? Participant tracking of this nature can be captured by a documents-centric methodology and serve as snapshots of unfolding organizational practices.

**Digital instrumentation**. Given the ever-expanding range of programs available to collect digital traces it becomes a significant task to determine the appropriate software and configuration needed to capture data with the desired level of granularity to address research questions. Distributed collaborators often use different email clients, servers, and operating systems which limits the types of tracking software that can be installed on participant computers. Differences in email clients and institutional difficulties in accessing mail servers curb, to different degrees, how one can catalog documents. Unsurprisingly, the blurring of work and personal documents is prevalent. Isolating those messages and attachments that are pertinent to a particular work practice, thereby avoiding announcements about the childrens' soccer practice, requires us to explore how participants use their tools to partition different activities within their digital and physical environments. However, decisions about tracking tools do not need to be cast in stone as they would need to be for a laboratory setup. Ethnographers regularly adjust their participation and interview techniques to particular contexts and the evolving relations to informants. Similarly, a document centric study calls for a flexible approach to data gathering where the researcher continuously adjusts and refines data gathering techniques based on what has been learned to date. Filters are adjusted, added or deleted as work habits evolve,

new collaborators come on board, or changes to infrastructure require reconfigurations of tools. Responsiveness to the sociomaterial infrastructure of our field of inquiry gives "voice" to the technology (Latour 1996) and its role in distributed organizational practices.

**Commitment**. Many documenting tracking techniques require the active involvement of the research subjects. For example, at times we have asked participants to add our team's research email account to the recipient list for project relevant emails; to participate in behavioral inquires; to save project documents in folders accessible to the researchers; and to regularly scan collections for sensitive emails before they are analyzed by the research team. All of these activities consume the subjects' time and attention, as documented by the many computer science studies of document provenance that call for subjects to log changes to documents and applications over time (Dragunov, Dietterich, Johnsrude, McLaughlin, Li, and Herlocker 2005; Lonsdale, Jensen, Wynn, and Dedual 2010). From the research subjects' perspectives, these tasks quickly become a burden or the tracking activities simply fall to the wayside as more pressing concerns crowd out people's attention and they simply forget to "cc" the project account on an important email. Document centric studies that exploit digital traces require a set of data collection tools that balance comprehensive coverage against the commitment required of research subjects.

**Privacy**. Over the years, qualitative researchers have developed a series of techniques to afford confidentiality to their research participants and to keep private participants' identity and behaviors. However, dwelling in somebody's document universe raises a number of additional privacy issues. Most people use their computers for multiple purposes, many reaching deep into their private sphere. It can be difficult to set up a system that only monitors specific documenting practices and overly restrictive filters can mask important behaviors related to work practices of interest. As mentioned earlier, Dropbox and other file sharing systems allow researchers to track designated folders, but leave many other activities invisible such as applications and documents use during the production, classification, storage and retrieval of relevant documents. Further complicating matters, having access to a participant's communication also means having access to information about the individuals with whom he or she corresponds. Care needs to be taken in designing an informed consent protocol that adequately addresses the privacy concerns of all parties. As a safe guard for maintaining adequate privacy for participants, we recommend giving informants control of their own trace data and/or the opportunity to delete undesired documents before the researchers gain access to the data.

**Heightened awareness**. All qualitative research methods face a Heisenberg-style challenge where the process of observing can influence the observed. Document-centric data gathering is not different. When people are asked about their documenting work, they often develop a heightened awareness of their own habits and "digital hygiene," inevitably tidying and reorganizing files, sometimes right in the midst of an interview. This can include straightening piles of documents around the office, deleting files on a cluttered computer desktop, or finally taking the time to clean out a bulging email inbox.

Instead of seeing this as a threat to reliability, we see these actions as offering important insights into how research subjects perceive and work with their document infrastructure. Expressions of embarrassment about a desktop cluttered with digital files or a prideful boast about a "zero-inbox" policy reflect expectations, assumptions and intentions. It is also informative to see just how malleable documenting practices can be and understand tensions between documenting policies and the reality of unfolding documenting practices. Although a conversation with a researcher may motivate a participant to perform an email inbox purge, such enthusiasm is often short-lived, lasting only for a few days. Returning to the subject repeatedly through behavioral inquiries will allow the researcher to verify such observations. Thus, having research subjects react to the process of observation and the insights it gives them into their own documenting practices need not reduce the reliability of a document centric methodology, but may enhance it.

**Conclusion**

The document-centered methodology developed in this paper offers a new perspective on work in technology dense environments and a call for revised research strategies. Traces accessible through digital environments present valuable opportunities to examine not just the content of documents, but the rich contexts and processes that surround the creation, modification and dissemination of documents within and across organizations. We argue that this perspective has the potential to make important contributions to the study of organizational behaviors. The document-centered approach described here complements traditional ethnographic techniques such as participant observation and interviews by providing insights into important sociomaterial elements of organizational members work practices. Additionally, these techniques for working with digital traces provide a bridge to quantitative methods such as social network analysis and automated text analysis, introducing new opportunities for mixed method studies grounded in a document-centric perspective.

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