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Locating virtual field sites and a dispersed object of research

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Abstract

This paper reports from fieldwork exploring a Web-based information system in a multinational pharmaceutical company. The discussion revolves around research methods for exploring the development and use of distributed information systems. A common mode of doing fieldwork within a single site is introduced, and the paper argues that this mode does not sufficiently tackle the particularities of the phenomenon under study. These particularities include geographical distribution and lack of overview, multiple variants of the system-in-use, as well as uncertainties concerning the involvement of the researcher. As an alternative, the paper explores ways of thinking and conducting qualitative research that may incorporate the complex, emergent, and at times paradoxical nature of contemporary information technologies as well as locate the researcher within the terrain explored. The paper thus depicts the researcher's experiences with an open-ended multi-sited research design and shares the lessons learned.

Keywords

Multi-sited research design, distributed and emergent information technology, design-in-use

Introduction

In Information Systems Research we think of entering and being in the field as a legitimate and valuable way of producing new understandings of and insights into technology production and use practices. Empirical field studies are recognized as relevant for gaining insights into a specific domain of work or into particular settings and contexts where information technologies are in use or soon to be implemented. Also, we have increasingly come to view fieldwork as pivotal for developing concepts and analytical understandings of information technology and work practice. The work of Suchman (1987) on the situated character of human-machine communication, Heath and Luff's (1992) study of a transport system control room, and Orlikowski's (1993) examination of Lotus Notes in use are a few such examples of field studies that have served to re-orient the research agendas and concerns of Information Systems Research in valuable ways. These works have pointed to ways in which technologies become located in specific places and practices and have focused our attention on the intricacies of how technologies come to work successfully or why they fail.

In the seminal studies mentioned above, along with most other research based on field studies, we tend to consider the site and object of study as preceding the empirical investigation. We think of a field study as a situation in which the researcher in person enters a bounded site, for example a particular organizational department or a single control room, to investigate the nature and characteristics of the setting for a specific period of time. Such notions of field study and fieldwork rely on the concept of a *field site* as an already delineated geographical location and on an *object of study* that pre-exists the study and lies out there just waiting to be discovered.

When investigating distributed technologies in networked organizations, however, locating and delineating exactly where the field begins and where it stops is not a simple matter. Likewise, information systems that are emergent and used across distributed locations pose challenges to pinpointing exactly what and where the object

of research is.

Drawing on the work of Marcus (1995) and Newman (1998), both working in Anthropology and Science and Technology Studies, this paper suggests new ways of thinking about fieldwork in distributed settings and presents alternative conceptualizations to the common fieldwork tropes of entering sites and discovering objects.

Newman (1998) asks what difference it makes that sites of study no longer can be bounded by place-based notions, that sites are characterized by global reach and extensive, layered mediations of people, practices, and technologies. She poses the problem on the one hand as one of access, of how these characteristics shape conditions of fieldwork and the specific positions a researcher can take up in the field. And on the other hand, she sees this as a problem of pragmatically locating a site that is both distributed across time, spaces, persons, organizations, and things, and continuously shifting in relation to other networks, alliances, and organizational restructurings. Newman presents her study of a software development project in a commercial setting and relates how it became necessary "to adopt a more distributed, more negotiated, and more *virtual view of the site* as a basis for ethnographic action and understanding" (Newman 1998: 236, my emphasis).

Similarly, in a discussion of post-modern ethnography, Marcus (1995) compares a common mode of field research to a *multi-sited research design*. Research within the common mode focuses intensively upon one single site of observation and participation and subsequently relates the material to a wider global or macro-theoretical context. In contrast, a multi-sited fieldwork strategy takes as its focus of investigation the connections and circulations between multiple sites. Thus, Marcus does not approach the global (or macro) as an outside or contextual aspect of study, but traces and questions the connections of the local and the global as a starting point. Multi-locale ethnography "moves out from single sites and local situations of conventional ethnographic research designs to examine the circulation of cultural meanings, objects, and identities in diffuse time-space. This mode defines for itself

an object of study that can not be accounted for ethnographically by remaining focused on a single site of investigation” (Marcus 1995: 96). Moreover, Marcus suggests thinking about fieldwork and qualitative research methods not as a set of prescriptions laid out in advance, rather in terms of the designing of a multi-sited space that is iterated and adjusted throughout the research process according to findings, challenges, and shifts in focus (Marcus 1995: 90).

Both Newman and Marcus thus suggest a way in which we might rethink our research sites, not as places that are geographically delimited, but rather as an open-ended space of possibilities. Such a space is continuously carved out as part of a research project, according to specific resources, here and now situations, opportunities, and interests. This way of thinking about fieldwork, positions (and reflects upon) the researcher as an active part in constituting this space, in selecting, connecting, and bounding sites of investigation as well as objects of study.¹

In this article I build upon this work and more specifically my own fieldwork to argue that a common mode of fieldwork does not adequately address issues crucial to the contemporary technical phenomena we study within the field of Information Systems (IS). The paper conveys my own experiences with a multi-sited research design and takes preliminary steps toward exploring what new notions of multi-sited research, virtual field sites, and dispersed objects of research might entail, both practically and theoretically, for the study of distributed information systems within IS research.

The study

The fieldwork concerns a web-based information system in a multinational pharmaceutical company.² As formulated in an early research proposal, I intended to explore empirically how this web-based collaborative information system was integrated in distributed work practices and the subtle ways in which such integration might entail re-designs of both work and technology. The research was (and still is) thought of as an entry into debates within Information Systems on web-technologies and design-in-use. Here, attributes

of openness or flexibility attached to this type of technology had revived debates on end-user design and indicated possible reconfigurations in the entrenched distinctions between professional designers and lay users (see e.g. Bansler and Havn 1996, Lyytinen, Rose, and Welke 1998, Truex, Baskerville and Klein 1999, Lamb and Davidson 2000). Based on a study of one such web-based information system I hoped to produce empirical material useful to theorizing the ways in which design and use might be blurring as categories, how these might be continuous processes without end, and perhaps increasingly dispersed across a proliferation of lay users, super users, professional designers, information architects, maintenance personnel, and various other new intermediary actors. Thus, an interest in design-in-use, various IS studies, and a collaborative research program formed the initial context of research.

The production of pharmaceuticals was selected as a compelling context for this research due to the global and networked character of the work and a high dependency upon web technologies. A multinational company, with headquarters in Copenhagen, Denmark, was chosen along with one specific web-based information system, referred to as ProjectWeb.³ The first version of the system had been developed internally three years earlier with the formal objective of facilitating collaboration and coordination within large pharmaceutical research and development projects.

ProjectWeb has since been redeveloped twice with the active involvement and participation of various “users”. The system is browser based and includes a home page and templates for publishing project news and information, a document database with adjustable menus and folder categories, a yellow pages directory with contact information on project members and groups, an events calendar, and a discussion forum.

Much of the fieldwork and initial analyses were carried out collaboratively (see acknowledgements). The material, generated in the course of one year, comprises semi-structured interviews, observations of everyday work situations, and participation in a design workshop. In addition to these interviews and

observations, we used document analyses of a user manual and of other written materials relating to the system and the corporation. Other material consists of transcribed discussions among users, historical narratives on earlier versions, and a focus group interview, for which we had set the stage by sending out an article on our preliminary findings in advance. Finally, use statistics generated by the system and our own examination of the system have provided data for the study.

Outline of the paper

The paper is organized chronologically to illustrate a series of research activities, challenges, and lessons learned in working with a multi-sited research design. Following this introduction, I discuss my initial attempts to locate and gain an overview of a field site comprised of dispersed and shifting practices. Here I convey the notion of a *virtual field site* that is the product or outcome of research activities (as opposed to something preceding these). Next, I turn to some of the practical fieldwork challenges of pinning down and identifying a *dispersed object* and discuss the elusiveness of the technical phenomenon under study. These difficulties set the stage for an analysis section that juxtaposes and compares three different variants of ProjectWeb encountered in the field. A method of juxtaposition is proposed in order to encompass and make pivotal some of the contradictions encountered in my attempts to delineate and define the research object.

The conclusion summarizes how both site and object seem to shift and transform throughout research, and thereby, counters the view of field sites and objects of research as pre-given. I argue that new understandings are urgently required and that a framework of *multi-sited research design* may provide one possible way of transforming contemporary methodological challenges into a productive source of new insights, surprises, and opportunities for the field of IS.

Gaining overview of a distributed research site

As is usually the case, my research commenced with a literature survey to delineate the field and gain some understanding of the particularities

pertaining to the site and case at hand. Here, complexity and large, long term projects were recurring themes in the existing research on the pharmaceutical industry. I introduce these in turn and then ask how one might tackle such abstractions empirically.

The research, production, and marketing of new pharmaceuticals was generally depicted as a long and complicated process relying on extensive global and cross-organizational alliances. The complex distributions in time and space were further complicated by uncertainties of product efficacy, intense market competition, constant time pressures, and a dependency upon inter-organizational alliances and governmental regulatory agencies (see e.g. Ciborra 1996, van der Geest, Whyte and Hardon 1996, Pisano 1997). In this literature, as well as in company documents (such as materials available in the company headquarters reception or the official development project manual), the production process was at the same time described in terms of projects living through predefined trajectories broken down into phases. One brochure, for example, provided me with an overview of the process of "how a new drug is developed". A timeline depicted phases labeled conceptual, pre-clinical, clinical, and regulatory. Each phase included a list of the main activities and achievements that had to be fulfilled in order for a project to move on to a subsequent phase. Such projects typically lasted up to ten years, comprised several hundred of people from many different professions, and extended across geographical distances and various time-zones.

As a first site-ing, both academic and company documentation thus served to carve out an overview of the field as made up of projects and phases.⁴ Moving from the literature study into the field, I hoped to unravel some of these activities and to explore in detail the part played by ProjectWeb in facilitating such complex and distributed work. But where to start in mapping out a project being carried out in many places at once? From where might I gain an overview of the distributed work that constituted a project?

Overviews available on site

In first exploratory interviews I met additional images of pharmaceutical projects and strategies for seeing the project as a whole. The examples

below indicate that problems of scale and complexity, and of the lack of visibility and overviews, was not just a problem encountered by me as a researcher. As it turned out, the lack of certain specific and authoritative representations was also prominent among the people participating in the field.

During one of these first interviews, Lars, a Preclinical Coordinator, explained the company structure, a project, and his location in it. For Lars the project is something constantly shifting and activating different places and specialists.

"I conceive of the company as the usual pyramid structure with managers at the top and all the departments underneath. And a project is something that moves across the pyramid, you know, and activates whatever is necessary in the given project phase. When we make a drug, then it's all the chemists that are involved. And then when we test it on people, then it's not the chemists that are involved. We are still in on the project, but others are the ones that are activated... I am preclinical coordinator, so I manage the ones that sit up here in Glostrup (town name). I have a taxonomist, a geneticist, and a metabolism analyst. I make sure their things are collected and sent up to the project, and then, of course, I pick up on orders from up there and get them out. " (Interview with Lars, Preclinical Coordinator)

As Lars explains, a project is something that rolls across departments and activates whoever and whatever is necessary. Who (defined by organizational and geographical location and professional identity) is "in", "out", or "active" is thus continuously shifting, and a lot of work goes into making the project - coordinating back and forth between a given group, others elsewhere, and the project "up there" from where Lars picks up orders. So in addition to the project being dispersed across a large number of people, professional identities, organizational units, and organizations in Denmark and elsewhere, projects seemed to be continuously shifting with regard to the specific departments and experts involved. Uncertainties of market competition, clinical trials, and frequent organizational restructurings play into shifts and the continuous redirecting of a project. For Lars, the project is about sorting out such shifts, who is activated and doing what at what time. The

project is thus something that requires continuous coordination and a lot of paperwork. Such work is described later in the interview as tedious and stealing time from the "real work" of research in the laboratory.

My problematic attempts to locate the project thus resonated with complications on site. Size, distribution, and shifts within and between projects rendered it an achievement for those involved to gain an overview of status and progress and to ascertain who is active with what tasks.

Interestingly, this issue of overview was also folded into the web-based information system I was there to investigate. The main IT developer of ProjectWeb recalls the needs of pharmaceutical development projects when he started to build the first version of the system. According to this developer, ProjectWeb was conceived as something that might tie research and development projects together across the time span of a project, as it moves through phases and different people enter or become active in relation to the project:

"... It was a meeting point for a project. Not just geographically, but also so that everyone in the project could follow – when a project starts over in the research lab and they have the research results, they go into the system. And when the research lab is done, when they have something that might become a product, the whole batch moves over into the development department. And then the whole batch moves on into marketing. You can look back and find all the documents without having to walk over to the laboratory, find a researcher and a folder that is placed on some shelf or something. Those were the kind of thoughts we had about it then, and those are the things we could tell that they needed." (Interview with Michael, Systems Developer)

According to Michael, technology is potentially the main place or meeting point for the project, something that could collect and store all project information and hereby make it accessible and independent of the people and places involved in the production of, for example, research results and development strategies. Michael implies that ProjectWeb might alleviate or stabilize the chaos and complexity of projects

that are spread out all over the world, moving and shifting.

Both Lars and Michael were thus also working to establish an overview. Likewise, different attempts to get on top of the project or the notion of ProjectWeb as providing “a shared place or space for gathering the whole batch” echoed throughout other interviews. Other interviewees explained that by way of ProjectWeb, project members and those activated at different times could find necessary information, people, previous results, and records of decisions made along the way. Thereby, project managers and members of the project team could see research activities elsewhere, get a sense of progress, and relate and coordinate their own work tasks to activities elsewhere despite the obstacles of space, time, and uncertainty.

Thus, the project, which I first identified as a possible site, was virtual in the sense that it could not be observed from one place or mapped out in any precise and exhaustive representation. Instead, it was more of an *ordering device*, an arrangement for coordinating distributed work, making it visible, mutually accountable and coherent (Callon and Law 1995, Button and Sharrock 1996). The nature and status of *the* project was thus a product or outcome of many different and continuous activities. Here a main resource or opportunity in picturing such a virtual field was therefore to remain attentive to local practices and how those involved established their own overviews and pictures of the whole.

A virtual space of possibilities

A first methodological step was thus rethinking the site in terms of a virtual space as proposed by Marcus and Newman. This space was made up of many sites linked together through my research, in relation to particular research interests (in a distributed technology designed and used across many sites), in relation to literature and existing studies, and in relation to local overviews. To locate my field site I thus drew on manuals and plans, timelines and pipelines illustrating where a project is, world maps highlighting locations of project members and allied firms and research institutions, images provided by people involved, and views

provided by technologies on site. For example, the project as a temporal construct, various material representations of phases and milestones, the imagery of the pyramid, other organizational diagrams, and spatial ideas of the project up here and out there can be seen as ordering devices for reducing complexity and constructing overviews that are useful for those engaged in the field as well as for the researcher. Just as the project was redefined as a range of practices and ordering devices, my site was likewise the outcome of my research practices and various methodological devices for seeing, linking together and tracing out a space corresponding to particular analytical purposes.⁵

Moving away from both the notion of ProjectWeb as something integrated *in* projects and as located in a field site, my research thus shifted focus to how ProjectWeb took part in *making* projects, how it constituted projects by actively organizing the complex links and practices of pharmaceutical work and thereby assisted in establishing overviews of it. Having gained this new insight, I gave up on the notion of full mapping and instead strategically tracked down active users within three projects and people specifically engaged in making ProjectWeb a useful part of project work. This included intermediary actors engaged in setting up, configuring, and maintaining the system for use by others. Hereby, constituting a field site relevant to my questions and analytical interests.

Grasping the object of study

In recognizing the field site as a virtual space, in part an outcome of my analyzing it, followed similar insights concerning the object of study. In working through encounters with ProjectWeb in the interview and observation material, the technology seemed difficult to pin down and paradoxes surrounding it appeared abundant. Firstly, I found that actual use occurrences – when a project member opens the application and does something – were infrequent and very brief. The system was only opened and used for 5-15 minutes a day and sometimes not at all. Use situations, a person in front of a desk top computer, were difficult to observe (or participate in) and the very transformations of technology and work I hoped to record seemed too subtle to spot when there. So besides the

system's reach and scope, figuring out what exactly to look for when planning observations followed. The technology ProjectWeb was either not used or comprised a somewhat invisible part of work. In dealing with this problem, a system description report and screen dumps became important resources for getting close to (and subsequently filling in) the materiality of the system that was difficult to grasp in observation situations. Also, breakdown or problematic situations became crucial analytical moments in which ProjectWeb became more present and observable.⁶

Additionally, ProjectWeb appeared to be more than one thing. It related in various ways to specific activities, professional orientations, as well as to other technologies. In use, ProjectWeb was, for example, entirely integrated with a range of other more mundane technologies such as e-mail, word processors, presentation software, local area networks, web-publishing tools, the company intranet, as well as an extensive array of more or (most often) less visible software and hardware components.

Descriptions and usages spun out in many directions, and ProjectWeb was described as a means for storing and searching/retrieving information, bringing together and delineating projects as a community, team, or family, delineating one project from the other, and enabling movement between these. Also, it was seen as a means of managing and coordinating tasks within the project as a whole and within subgroups. Some described it as a secure space for distributing confidential documents or collaborating on specific issues within smaller groups. Some, in contrast, described ProjectWeb more as an archive for future use, for example for new projects, or as extra documentation back up in case of lawsuits. Also, these discussions concerning ProjectWeb would constantly slip into various debates, for example, on tedious bureaucratic paper work vs. the "real work" in the lab. Or, contests on how to share confidential information within and between projects, how development projects should be managed, coordinated, and standardized most effectively.

In addition to the invisibility of ProjectWeb in daily work, and to the multiple uses, debates, and contests layered onto this technical

phenomenon, it also became evident that descriptions of ProjectWeb did not align with actual use practices. ProjectWeb seemed to be accompanied by, and enveloped in, potential and future benefits as well as impressive stories about the role of the technology in other research projects taking place elsewhere.

Adjusting the research design

What kind of research design might preserve such differences and paradoxes? How might research be methodologically sensitized to an object of study that *is* in different ways at different times and places? Evidently, predefining the object of study worked against such aims. Instead, thinking in terms of a multi-sited strategy of tracing and following connections provided a possible path for juxtaposing many actual and potential outcomes in parallel (Marcus 1995). Also, inspired by Hanseth and Monteiro's (1995) call for "being specific", I aimed to preserve the ways in which this use context and ProjectWeb in particular intermingled. Focus shifted to revolve around the multiple and often paradoxical nature of ProjectWeb and possible strategies in which further research might address such issues, rather than exclude them as being outside technical phenomena or too disorderly for a clear-cut analysis. A strategy of juxtaposing differences worked to deliberately expose the technical phenomenon in multiple ways. This was done through fieldwork by visiting different sites and practices, continually contrasting the differences encountered. And subsequently, in initial analyses, by singling out selected events or situations and unpacking these from within as different variants or modes of the same object.⁷

To elaborate on this notion of analyzing in parallel different variants of the object, I will present an analysis of three field encounters with ProjectWeb. The first situation is a workshop presentation, where the object, ProjectWeb, is depicted on a blackboard as a set of discrete technical entities. The second encounter, my observations of a secretary's work in the Project Management Department, traces a series of activities through which ProjectWeb gets assembled and made to work. And lastly, in an interview with a medical writer my research questions intervene in the very

object and issues under scrutiny. The examples are brought together in analysis to make pivotal how ProjectWeb formed part of very diverse practices and illustrate how these can be analyzed in a parallel way to rework assumptions and pre-given notions of what constitutes the technical phenomena we study.

Workshop presentation: ProjectWeb as system and sub-systems

The first field note is taken from a workshop presentation preceding the development of version 4.0 of ProjectWeb. We are in the building of the development company and the main developer has invited 20 employees from the pharmaceutical company, many of whom had been involved in the development and testing of previous versions. He has sent out an agenda for the day and a report concerning old and new features and functionalities of ProjectWeb. As the workshop commences with a presentation by Carl, the graphic designer of the previous two versions of ProjectWeb, most of the participants take out a print of the workshop agenda and the report.

Carl starts his presentation by walking up to the blackboard at the end of the room and writing the question "What is ProjectWeb?". He runs through ProjectWeb's development history and explains how it was first developed as a document management tool for project use and how it expanded through use into areas of content management as well as project management as new modules and features were added. He adds that today we even find it providing glimpses of e-Collaboration possibilities as smaller groups within development projects have taken up the technology for working together on specific short term tasks. After writing the words Document Management, Content Management, Project Management, and e-Collaboration on the blackboard, Carl rhetorically asks himself how these aspects of ProjectWeb link up to or compete with other systems. Regarding document management, he mentions Documentum (a central company database for all regulatory documents concerning, for example, clinical trials), private and public file folders on local area network servers (LANS), and Lotus Notes, which has been employed for

collaboration in some projects and departments. He illustrates each of these systems on the blackboard with database symbols. ProjectWeb for content management competes – or could possibly be tied to – a range of databases, the WebstarterKit (an internally developed web-publishing application), a web version of Lotus Notes, Broad Vision, Interwoven, e-Venture, Luna and others. Next, e-Collaboration competes with Outlook Exchange (Microsoft calendar system). After elaborating on the similarities and differences between these technologies depicted on the board, Carl moves on to describe how ProjectWeb could become "a very cool system if we establish processes to use it systematically. ProjectWeb has a little bit of all of these features" (the other systems now on the blackboard). The picture on the blackboard now resembles the figure from the report in front of all the participants. Carl suggests that by "putting it all into one huge bubble then we can actually talk about Knowledge Management instead of competing systems". As he explains he draws a big circle around the many system icons depicted on the board. (Workshop field note)

In this situation, ProjectWeb is made available as an object of discussion and redevelopment through the set-up of the workshop, several annotated report copies on the table, the drawing on the blackboard and Carl's description and characterization of ProjectWeb. The report, the drawing, and the presentation define the current version of ProjectWeb-in-use by features of document management, content management, project management, and e-Collaboration, a typology or classification scheme common to people working within the area of technology production. ProjectWeb is thereby defined through its similarities to four more general types of systems and its placement in such a classification scheme. Furthermore, the question of "What ProjectWeb is?" is posed in terms of singularity and answered through a comparison to other singularized technologies, both generalized types and specific products developed elsewhere and either competing with ProjectWeb or potentially interfacing with it.

This version of ProjectWeb might be seen as intricately linked (and constituted through) practices of technical redevelopment and market

competition. ProjectWeb is a discrete technical entity that can be plotted onto a larger inevitable technical trajectory of past and future system types. The current version, benefits, problems, features, and functionalities are spoken of and continually redefined in relation to a future version and potentialities and vice versa. The future vision - of what ProjectWeb might come to be - cuts across all systems and envisions ProjectWeb as an "integrating tool that allows putting it all together" in one bubble for knowledge sharing among dispersed project members, as a superior technology that might subsume all the others.

This depiction of ProjectWeb is not Carl's alone, nor is it particularly strange or surprising. The notion of a singular generic system, classification schemes of (singular) system types, and talk of technological phases and trajectories can be traced through an extended network of engineering education and practices. It can be linked to stories of new technologies circulating in these networks and media, as well as to academic practices of theorizing technical development such as some of the IS literature referenced above (e.g. Bansler and Havn 1996, Lyytinen, Rose and Welke 1998, Lamb and Davidson 2000). These notions are thus tied to common engineering practices and market competition as well as the set-up and purpose of the workshop. Constituting ProjectWeb in this way, as a discrete technical entity, is necessary and productive for laying out a strategy and plan for re-development. What is surprising, however, is that a comparison to other situations and practices may call into question the discrete nature of ProjectWeb.

Office observation: ProjectWeb as work

This next excerpt is from observations in the Project Management Department. Isabelle is a Project Assistant, a secretarial position under the Project Manager. I had met her at the workshop discussed above and asked if I could follow her around for a couple of days. During these observations, I noted some of the work that goes into assembling ProjectWeb as a working system. Opening up one situation from these observations provides a very different account of "what ProjectWeb is" as asked by Carl at the workshop. In the office of Isabelle, ProjectWeb

seemed to transcend its boundaries as a singular technical object. Isabelle's activities show that ProjectWeb works to link people and projects together and how, in order to do so, many other connections between various technologies, people, and activities need to be in place.

Isabelle opens the email program Outlook and clicks on one of the newly arrived emails entitled "CPoP pictures". It is from Ulf, the project director whose office is two doors down the hall. The email opens up to 15 pictures of people drinking champagne. In the pictures green banners and bright balloons, with the words "CPoP Celebration!", "CPoP - We made it!" printed on them, hang down above the people and the cake-covered buffet tables. As Isabelle looks through the pictures on the screen by clicking the mouse and enlarging and minimizing the pictures, she laughs at some of her colleagues and explains to me who the people are: "That is Jens from the Clinical Department. They made a presentation about the project with him, Mads from Marketing. The guy here in front of the projector screen is our old project boss, now part of the project's top level Steering Committee." Through Internet Explorer she opens the ProjectWeb to post the pictures of the CPoP celebration to the news page of her project's ProjectWeb. (Office observation, Isabelle, Project Assistant)

CPoP is pharmaceutical project-speak for Clinical Proof of Concept. CPoP is about passing what they call a project milestone or decisive point that distinguishes one project phase from another. The product under development has been approved for further development by a Management Reference Board, thus moving project work into a third phase of clinical trials. (Described in the project manual as testing the product on larger and more differentiated groups of patients).

Next time project members elsewhere open and log onto ProjectWeb, news of CPoP and these pictures will be visible. The party pictures marking this event will appear along side news about a recent conference in Athens, the latest information on the development of a competing product, and a link to a world map showing where the new product will be marketed. Isabelle explains to me how important it is to publish visuals, pictures and graphics in

ProjectWeb, as a way of increasing awareness about what is going on in distant places, for getting to know one another. In posting these pictures ProjectWeb participates in the staging of the event as an important turning point.

As discussed in earlier in this paper, this is a moment in which ProjectWeb participates in making the project, in connecting people in distant places and rendering events taking place elsewhere present and visible (Callon and Law 1995). Here the object ProjectWeb is more than a technical entity in the sense that it is *inseparable* from project activities and events, notions of virtual communities, and digital spaces in which people may meet, get to know one another (or laugh at one another).

To upload the pictures Isabelle clicks her way through the administration menu to the page "add news article". Here a template presents a series of boxes and buttons for selecting keywords, filling in date, title, and abstract sections and adding a picture with the "add image" button and a browse function. Isabelle moves quickly through this sequence and knows from previous experience to upload the image file to the "library images" page, another similar page and template. Shifting back and forth between the two pages, she clicks the button "upload new image here", saves and previews the article. A news page appears where the picture fills up half the screen. "Oh, it's too big" Isabelle remarks, and to adjust the size she opens another program, Photoshop, that offers menus and functionalities for adjusting the size of the digital image. She then walks through the steps of uploading the image and then goes through upload, save, and preview on this template again. When preview appears, the picture still fills half the screen, "oh, it's because I forgot to save it (the PhotoShop image file) before I previewed". Isabelle shifts over to Photoshop, saves the files, and repeats the template steps above a third time. (Office observation, Isabelle, Project Assistant)

In this sequence, ProjectWeb begins to act more like an application or program, in the technical sense. ProjectWeb performs a specific task or function (almost) on demand. The administration section of ProjectWeb presents a template and various possibilities, and paths that

are predetermined in order to publish a picture and text on the news page of ProjectWeb. On each page certain boxes must be filled out or clicked on in specific ways and sequences. The abstract section, for example, cannot be empty nor exceed 2048 characters. To choose more than one keyword, the Ctrl-key must be held down while clicking with the mouse. Before clicking the upload image button, image must be uploaded in "library image pages" which presents another set of prescriptions. And so on. Isabelle fills in the template as an experienced user. The pages and functionalities enable and structure this work of publishing project news. At the same time, she also engages in the creative work of re-negotiating the possibilities and functions provided. Redoing the sequence three times is a sort of tinkering work, where the incompatibility between specific ProjectWeb functionality and the file format of the digital images is negotiated into alignment.

What follows is an extension of the functionality and possibilities provided by the ProjectWeb news section. Isabelle attempts to create a hyperlink from the news page to an additional Web page that she creates in FrontPage (Web-publishing application). The "add news article" page only permits one picture per article, but by making a page extension Isabelle makes it possible for project members to click on a web link and see more party pictures on a different page. Creating ProjectWeb as a virtual space or meeting point that may link together people and projects thus entails following templates and specific instructions, tinkering with these, as well as extending them.

Isabelle struggles, since pictures on the linked page keep coming up blank. She goes through several attempts and strategies to locate the problem and to get these pictures and the additional web page to connect with ProjectWeb as an artifact. She moves back and forth between different desktop applications, incompatible file types, does a lot of redoing and rechecking of the hyperlink paths and the folder placement of files. She looks back at a page she has made earlier in an attempt to find out what it is that won't work. She looks through a manual and tries out various trouble-shooting possibilities. At one point, she walks down the

hall to ask Mia, another project assistant, who recognizes the problem “yeah, that happens to me sometimes as well - just try uploading both the Web-page and all the pictures again”. After this Isabelle redoes the whole thing and a new set of contingencies arises when ProjectWeb replies that the page can not be uploaded when a user page with the same name already exists. (Office observation, Isabelle, Project Assistant)

Making ProjectWeb work as a meeting point thus involves tying together a range of other programs, people, and practices in order to work as a meeting point where dispersed project members may see the project and the latest achievements. This situation can be coined as the *work to make it work* (Bowers 1994) or an *artful integration* of heterogeneous elements (Suchman, this volume), something that, for example, these authors have pointed to as key characteristics of any well-working technology.⁸ ProjectWeb becomes a meeting point, and provides overview for project members, through an assemblage of emails, digital images, events elsewhere, representation of projects as phases and milestones, inscribed templates and routines, Isabelle’s earlier experiences with ProjectWeb and HTML, other desk top applications, other people down the hall, and a use manual written by one of her colleagues. In comparison with Carl’s singularized account, this example provides quite a different variant of ProjectWeb. Here ProjectWeb is both the means for linking up complex and distributed work as well as additional work to make it work.

Interview situation: ProjectWeb as potential

The last example I will present comprises a few passages from an interview with Olivia, a Medical Writer working in the Clinical Recording Department and part of Isabelle’s project. Her name was provided by the director of the Management Department. A colleague and I interviewed her expecting to find a real end-user, who might need the earlier documents, abstracts, and articles that were stored by ProjectWeb and who might also contribute content such as new articles, summaries, or application material to these sections of ProjectWeb.

Starting out with the thematic bullet points on my interview guide, we discuss Olivia’s daily work and her role in the project. She is responsible for reporting on clinical trials and putting together information on various testing procedures and results in a form presentable for the governmental regulatory agencies around the world. We discuss her work, her main co-workers, their locations and means of communication. A lot of her work consists of corresponding with a partner firm in California. Moving to a discussion of ProjectWeb (developed in part for this sort of cross-continental collaboration), she explains that she hardly uses the system. She “goes in now and then” and occasionally sends project documents from the regulatory team to the project assistant who uploads these. Yet the system does not link up to her work in any specific way.

“I don’t think our ProjectWeb has been given much attention. I know a lot of people don’t even think about using it or really know that it exists... It is still a new way of communication, and people are more used to email. Or if they want other information out there, they go on the Web. No, using it as a tool within hasn’t really broken through yet, not in that way.” (Interview with Olivia, Medical Writer)

Here ProjectWeb is related to email, the web, and the way it is used elsewhere in other projects, where perhaps more attention has been put on introducing and maintaining ProjectWeb. This example was, at the time, somewhat disappointing, since my object of study was almost non-existent to Olivia and her work. This kind of example is indicative of ProjectWeb’s partial failure: that simultaneously with being an object of enthusiasm and re-designs in one context, ProjectWeb is also foreign, or simply irrelevant in another. In contrast with the many relations and associations traced in the previous two examples, this situation is marked by the lack of connections and links. ProjectWeb is a vague entity, an object without much form, that is, apart from my interview guide, questions, and suggestions.

Later in the interview, in a discussion of Olivia’s main working group, I explain the possibilities of using ProjectWeb to work together on specific issues within smaller sub-groups, as opposed to ProjectWeb as a space for sharing

documents within the whole project. This includes an explanation of how restricted areas and menu categories entitled “drafts for commentary” may support this kind of group work without jeopardizing the confidentiality of the shared or unfinished materials.

“No, we haven’t used it for that. For lots of reasons... We, however, do have this one group, the clinical development team of about 20 people from the departments I mentioned before, clinical, regulatory, and the safety people. We meet once a month, and it would definitely be really great if we had our own little place, because those are the people I need to get hold of when I send out my report for comment. There I would be able to put it up, and the people who were interested and had the access rights would be able to go in and have a look. Can you decide on the format yourself?” (Interview with Olivia, Medical Writer)

In this situation, the researcher (myself) is the one laying out possible uses, explaining what the system is and what it might be able to do. These suggestions derive from IS literature, discussions within my collaborative research program as well as being based upon earlier interviews and observations elsewhere. These potential uses are made present and linked up to Olivia’s work activities through my research and the interview situation.

The set-up of the interview, my questions, interests and interview guide, and the conversation with Olivia seems to constitute a third variant of my object of study, one of potentiality and future use. At the time, this situation posed a paradox in that my investigations of use practice ended up providing the ideas and potentials about what ProjectWeb can be used for and how this not-yet-user might benefit from using it. This might be seen as a finding concerning “user needs” or “demands” related to ProjectWeb, yet I suggest that these are created in and the result of the situation and our discussion. This interview thus served to trace the lack of connections, but at the same time opened a space for new links and possible connections to be made. This situation sparks up new considerations and reflections on site, and makes possible interests and activities that might not otherwise have been.

Methodological considerations

The analyses above emphasize how people involved in the fields we study themselves continuously are engaged in processes of defining technology, aligning it with here and now practices and orientations. Such practices seem to be always ongoing and often unfinished, and more than merely matters of interpretation. These are practices that can be studied as producing different modes or variants of a technical phenomenon (de Laet and Mol 2000, Law and Singleton 2000). The workshop version of ProjectWeb offers an example of systems development practices. Carl is in the course of the workshop actively involved in defining what ProjectWeb is, its problems and benefits and the necessary actions that should be taken for further development. Isabelle’s work, in contrast, revolves around bringing together a distributed project and dispersed activities, posting an important event, and making ProjectWeb work for this purpose. Lastly, the interview with Olivia constitutes a ProjectWeb of future possibilities and potentiality for collaborative work.

At the same time, the examples thus illustrate my encounters with three variants of what the object *is* and how it might be studied: as a technical system that can be mapped out into parts and studied in relation to other systems and redevelopment, as ongoing work to be meticulously recorded and acknowledged through detailed observations, or as future potential and change invoked by the researcher’s active involvement. The very methodological strategy of juxtaposing multiple sites and working across different variants (ProjectWeb as system, work, potential) has served to question the nature of the phenomenon under study, and subsequently, to open a productive space for further analytical work on how distributed information technologies emerge through a range of differing sites, practices and concerns, that may be only partly overlapping.

Conclusion

In this paper I have traced a series of fieldwork challenges and some of the lessons learned from them, thereby also outlining conditions thought to be of a more general nature for IS researchers today. As qualitative researchers we are faced

with fields in which a bounded site for entry and immersion does not clearly delineate nor pre-exist our research practices. On the contrary, contemporary technologies seem to “happen” as simultaneous occurrences in a broad range of design and use sites that may be more or less connected. The practice of fieldwork is thus increasingly complicated by the lack of overview, issues of scope and scale, elusive and emergent objects of study, as well as uncertainties on the part of the researcher’s involvement. Such challenges of complexity can be approached as issues which require the development of new and better methodological tools, or alternately, as productive conditions that may press us to ask new questions and rework our limitations. In this paper I advocate the latter view instead of addressing these challenges as technical difficulties that may be tackled with more video cameras, log file analysis techniques, or perhaps screen tracking and screen capture technologies that allow the researcher to record mouse movements on many screens at once. Thus, I attempt to capitalize upon fieldwork challenges as opportunities for working through new ways of understanding IS field sites and objects of research: not as fixed entities preceding our studies, but as spaces of possibilities mutually constructed by our academic practices and the socio-material settings with which we engage.

Drawing on my own specific fieldwork experiences I have traced retrospectively a series of fieldwork activities that sought to incorporate and sensitize research to the problems and encountered. At the same time, I have looked at how these methods also worked to shift, transform and redefine the field site and object of study in particular ways. Each research activity from the initial research proposals and literature surveys to final analysis and publication writing is seen as moves or steps that carve out new connections and a space for further research as well as particular openings for producing results, theorizing or intervening.

Building upon the work of Marcus (1995) and Newman (1998), I have suggested a vocabulary that can be of help in thinking about the ways in which we as IS researchers take part in that which we study, how we constitute our field sites and objects of study, work to assemble and

bound these, cut them up and manipulate them in very specific ways. Notions of multi-sited research, of virtual field sites and dispersed research objects have thus been proposed as valuable for understanding and discussing fieldwork practices on and about distributed and emergent information technologies.

Finally, this take on fieldwork challenges shifts the very discussion of *methods* away from terms of access and representation, and more into a discussion of what kinds of methods are useful for linking up with particular sites and practices in a productive and desirable way. Urgent to any research design, as well as the very activity of fieldwork, become questions on what kind of pathways and spaces of possibilities we want the particular research project to constitute, what practices the researcher should engage with, connect to and strengthen, or, disconnect from. A multi-sited framework is thus finally thought of as helpful in laying out and waging the politics implied in any research venture.

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Notes

1. This work is inspired by constructivist approaches developed within Science and Technology Studies (see e.g. Haraway 1991, Latour 1994, Callon and Latour 1995, de Laet and Mol 2000, Michael 2000) and by discussions at the workshop “Ethnographies of the Centre” organized by Lucy Suchman at Lancaster University, September 2001. For related discussions on anthropological fieldwork see also Amit (2000).
2. I refer to this work as qualitative fieldwork rather than ethnography since it is carried out within a research tradition of IS and more targeted in scope than ethnographic work within, for example, the field of Social Anthropology.
3. Colleagues in my collaborative research program provided access and initial contacts to

the company, the IT department (now an independent firm) and the Project Management Department, as well as an exploratory working paper on the system, ProjectWeb.

4. The notion of site-ing is borrowed from Newman (1998). See also Haraway (1991) for a discussion of the ideal view as a bird's eye overview that sees everything from the outside and from above.

5. These include open-ended and extensive interviewing methods, strategies for participant observation, document and interface analysis, as well as preliminary qualitative analysis techniques of open and focused coding, developing themes and story lines, and continually linking data to IS literature.

6. For a discussion of the invisibility and embedded character of information technologies, see Star (1999).

7. Michael (2000: chapter 2) offers a good theoretical introduction to understanding technologies as effects of material, social, and conceptual arrangements.

8. Following these authors, I suggest that however improved new versions of ProjectWeb might be, this overflowing and local assembly of various elements would most likely continue to exist.

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