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"I have, more than ever, a sense of the immovability of these institutions"

Lucy Suchman

The following is a transcript of an interview with Lucy Suchman conducted by C. Otto Scharmer on behalf of the Society for Organizational Learning, based in Cambridge, Mass. The interview was one of 20 conducted done by Scharmer as part of the Knowledge and Leadership Initiative, a collaboration between Otto Scharmer and Peter Senge, MIT, Ikujiro Nonaka, Hitotsubashi University, Michael Jung, McKinsey Vienna.

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COS: I have a list of five questions, but please feel free to deviate. My first question is what underlying questions does your work address, and what in your own life formed the context from which your research interests evolved?

Lucy Suchman: I'll just plunge in. I think one of my core interests is the question of how enduring orders of social life are constituted. I came upon that question as a student in anthropology.

COS: Where did you grow up?

Lucy Suchman: I grew up in Ithaca, New York, and my parents and stepfather were at Cornell. I studied anthropology as an undergraduate, but without the idea that I would actually

continue and become an anthropologist. I became more and more interested in developments around symbolic interactionism and ethnomethodology. I became very interested in challenges to traditional sociology that were based on the idea that social structure is not a given, it's ongoingly and actively constituted and reproduced. I found this very compelling because I was interested in change, and it seemed if things were ongoingly produced, then they could be produced differently. So it felt to me as though it opened up a space of a kind of contingency to the way things work that I found very heartening. I was a student at Berkeley from 1968 on, and like all students at Berkeley at the time, I was quite preoccupied with the major institutions in the United States, and what I felt was problematic about them. So that line of social theorizing was very compelling.

I was also very much interested in Native Americans, as many students of anthropology are. I was just overwhelmed by the sense of their wonderful ways of organizing and relating to the world. But it was a very terrible history, and I started to feel that the last thing that Native Americans needed was another anthropologist studying them. I thought instead I should study the institutions that were closer to my own position in life and that had tremendous consequences for Native Americans, for example, the Bureau of Indian Affairs. This was also at the time when the idea of studying up, as it was called in anthropology, was developing at Berkeley.

COS: "Studying up" means?

Lucy Suchman: Anthropology had traditionally been concerned with non-industrial cultures, or those that major Western societies were interested in administering and dominating, and that's carried over into the field. Even within American anthropology, the focus has always been on Native Americans, and then more recently on various minority groups within the United States, rather than on mainstream, middle-class Americans, on elite institutions, powerful organizations. In the 70s there was an initiative within anthropology that said: We have as much culture here as anywhere else. In fact, we have a responsibility to turn the anthropological gaze back on ourselves, and really understand ourselves as participants and co-creators of the world, rather than just as observers.

COS: Isn't that interesting? Because this is really mirrored in today's corporate practices. In knowledge management, aren't we trying to understand front line people, as we did foreign cultures, from an executive perspective?

Lucy Suchman: Yes, and in fact I worry about that, because I think there are some very strong parallels, and also lessons to learn from the history of anthropology. Anthropology has become extremely reflective and critical about its own historical role as a kind of service provider to colonial administrations. Administrators would start to recognize that in order to administer the colonies they needed to know more about what was going on there, and then they would send the anthropologists out to study that and report back. I think that there is a model of corporate anthropology that could be very similar if we aren't aware and careful about that.

Over the last 25 - 30 years there's been a tremendous growth in the awareness of the position of an anthropologist—of how political it is, and how critically important it is that you are aware and understand all of your various relationships and all of the various interests that are involved, and act responsibly within that. So it's not necessarily that you should no longer work in developing countries, but anthropologists now position themselves very differently. They tend to go and find indigenous organizations that are working for change and attempt to align themselves, to contribute to those organizations, rather than coming in from the outside and delivering up some kind of solutions. There is much more of an orientation to the fact that things are already going on there, and that your responsibility is to learn about those things, and then see if you can contribute to them in some way.

I think there are very strong parallels in organizations. Having spent time at a number of different organizations, I've come to believe that change is always in process at the front lines. Not everyone, not uniformly, but there are invariably participants who have an interest in thinking about what they're doing, and whether it makes sense, and how it could be done differently. Often these people are first line supervisors. They probably become first line supervisors because they have an orientation to the workings of the operation. But they remain first line supervisors because they want to be close to the action. In some ways those

people are ideally positioned to be informed agents of change. They are people who really know the work and are in a position to take something of an overview, to reflect on how things are being done. And I don't mean to glorify, there are good and bad people everywhere, but I do think that that's a very critical position. So the ways in which anthropologists have redefined their relationship to the subjects of their studies has a lot to say to organizational studies and technology development, or to any situation where people located in one place are interested in the operations or the activities of people located somewhere else.

COS: Very interesting. Now before we took that rabbit trail, I interrupted you. We were in the late 60s. By the way, I've noticed that quite a number of my interviewees spent their formative years then right here in the Bay area. For example, Nonaka was starting at Berkeley. Peter Senge was here at Stanford. Brian Arthur also came here around '68. So all sorts of people were here in '68.

Lucy Suchman: There was a lot going on here, that's for sure. Yes, I was talking about two strands. One, the alternative way of theorizing about the social world, and two, this initiative to study up within anthropology. They both came together for me in my fieldwork when I decided to go back to graduate school in anthropology. I wanted to do my dissertation on a study of a large corporation, because for me, and for many people with my background at Berkeley at the time, corporations were black boxes. They were just monolithic, undifferentiated, problematic institutions.

I was interested in understanding what the everyday life within a corporation was really like for people in different positions, and how it was that this effect that we were all so concerned about actually got produced. How did corporations actually get constituted in an ongoing way as big, powerful institutions? It was really that idea of trying to understand issues of size and power as something that was actively and continually produced and reproduced through the everyday activities of the people who made up these institutions.

Given that as my interest, one of my professors pointed me to another anthropologist, Eleanor Wynn, who was then at PARC. When I got in touch with her she was doing an interview project and was simultaneously trying to finish her dissertation, and had a lot of other things to do. She hired me as a research assistant and I transcribed the interviews and then wrote a paper with her about that. Through that I got to know people at PARC and became a summer intern here, thinking at the time that I would continue this idea of doing my dissertation on every day life in Xerox.

Once I got to PARC I got heavily distracted by a whole set of issues that I hadn't thought of before that were very interesting to me. I came into the office research group, where all these computer scientists were creating office information systems. In order to do that, they were modeling office procedures. It was clear that they believed that procedural office work was ready-made for automation, because computers operate through procedural programmatic kinds of instructions. I was very intrigued by this, and of course, I had a sense from my studies of human interaction and ethnomethodology that procedural office work probably wasn't at all like computer programs. So then I thought, what I'll do for my dissertation is go out and try to find *the* most apparently routine procedural form of office work I can, and explore the question of what ways it is and is not like a program, and in what ways the assumptions that were being made at the time about it, and that were informing the design of these systems, really were sound or not.

As a pilot for that, I did a study here at PARC at the accounting office. I sat with people while they processed expense reports and accounts payable and recording the transactions in the accounting office, and developed an analysis of that. It was the beginning of the whole line of argument that I developed around relations between procedures, instructions, plans—any kinds of schematic and prescriptive representations of how things should be done and the actual work of carrying them out. My argument was that it wasn't that people followed the procedure most of the time and then sometimes they deviated from that, it was that in order to follow the procedure, you had to engage in continuous forms of creative improvisational reasoning. The prescriptions that came to people in the accounting office, for example, about how to process an expense report were nothing like a little set of instructions for how to process an expense report. They were much more like a description of what the file should look like in the end. Or how to create a file for a given business trip, or purchase, or whatever.

They were oriented to the fact that auditors would come to the accounting office and open any file drawers at random, and pull out a file and inspect it. They were working towards creating files that, if read by an informed person, could be read as the record of something that was done according to procedure. That was a much more negotiated and knowledge-intensive process.

In a way, people working in the accounting office engaged in a kind of apprenticeship with the first line supervisor, who is still there today twenty years later. He understands this game inside and out, and knows how to work within the bounds of what's a legitimate business trip, but in a way that's flexible, creative, and responsive to the needs of actual people traveling. He's a bureaucrat of the best kind, where as long as you're respectful, you can call him up and say, "I'm trying to do this. Is there any way that can be done within the bounds of policy?" And he will be extremely creative about figuring that out. He'll tell you, "No, you know, that's outside the bounds," or "Yeah, we can do it if you do it the following way."

It's that kind of working with the procedure that I started to become very interested in. I started thinking about these procedures as artifacts. The procedural manual was the discussion about what was legitimate and what wasn't. All of these things were artifacts that were produced in the work, and then used as resources for doing the work. But they were produced and used in a very active way. They had to be continually brought into relationship with some actual case; some set of circumstances that were more or less strange or familiar. There's obviously a tremendous range in the cases that people are doing, and some of them fall very easily into this kind of framework and some of the them push the boundaries. But in every case there's active work going on of maintaining an accountable relationship between the policy and a given case, and that's really what the work is about.

All that implies a very different kind of computer-based artifact. If you're designing computer-based technologies for that work, that implies a very different kind of system than a view of that work as being completely routinized and immediately translatable into some form of automated processing. That played into a lot of discussions that were starting to happen at that time around knowledge-based systems, though it wasn't called that at the time. People in the office automation community at the time were saying, "Well, you know, we've had tremendous success with automation, there's no question. Major things have been done around payroll processing and in a whole lot of important areas. But we're reaching a point where we're going to have to shift our approach if we're going to actually address more of the work that's going on. We can't just keep going in the same way. And the shift that we have to make is from automation to developing systems that are tools to be used by human experts or knowledgeable people."

I was trying to work into that line of discussion, and push it as far as I could in the direction of, well you know, it's not just the people who have traditionally been identified as knowledge workers that we need to worry about here. It's everyone**.** If you look at any form of human work closely enough, you discover that it's a mix: some activities that we all consider tedious which can be usefully automated, and other activities that require judgment and practical reasoning of various kinds.

The traditional view is that organizations are organized hierarchically with increasing amounts of knowledge as you go toward the top. So there's a bottom layer of work that requires very little knowledge, and then as you go up in the organization, it becomes more and more knowledge intensive. Or as you move into the professions it gets more knowledge intensive. So we need to be thinking about two kinds of information systems, those that automate the routine work and systems that are augmenting the expertise of the knowledge workers.

What we've tried to do is turn that on its side, or its head, and say: Every form of work, from the most so-called routine to the most so-called knowledge intensive, is actually a mix of practical, tedious kinds of manipulations of materials, and thoughtful, knowledgeable judgment. The trick in designing information systems is to introduce bits of automation that will fit in to the work and do useful things, and then make it possible for people to work with those bits of automation embedded in the systems while leaving them the discretionary space to exercise the kind of judgment they need to exercise to really get the work done.

We did one project in a law firm. Lawyers are the quintessential knowledge workers, right? Part of the work of the firm was litigating very large class action cases, which involved going

through thousands of clients' documents to discover the very small subsets of the documents that were relevant to making a case. It's a huge search problem, and you have to be sure you don't miss a critical document. They have a complicated division of labor where both lawyers and temporary workers do different aspects of the coding of these huge collections of documents to try to create a searchable database.

I compared the work of a lawyer and of a temporary worker trying to show how a lawyer's work relied on a lot of very mundane, practical kinds of strategies, and the temporary worker's work relied on a lot of knowledge and reasoning about the case. Not to argue that they're the same, but to argue that the difference between them isn't that the lawyer is doing knowledge work and that the temporary worker is doing non-knowledge or manual work. Each of them is doing both. That means if we want to understand the difference, we need to understand it in a different way. I had some suggestions about those differences, partly having to do with the very different relationships that the lawyer and the temporary worker had to the case as it was being developed within the firm. I don't want to minimize the fact that the lawyer I was looking at had been to law school and had put in years of time coming to a familiarity with the practice of law, and that prepared and positioned her differently than the temporary worker. But it seemed as though there was a lot of gray area where in fact the temporary worker, given more opportunity to engage with the case, actually probably could have taken on more of the work that the lawyer was doing**.** If you were looking at this firm saying how can we maximize the efficiency of the firm? How can we maximize the extent to which we distribute the labor such that we're spending our money in the wisest way, it wasn't clear that that was the case. There were such strong stereotypes among the lawyers about the difference between them and the document coders, and what kind of work had to be done by lawyers and what kind of work could be done by document coders. I was just trying to trouble that boundary a little bit. I wanted to open up some other ways of thinking about what's going on in the way that we position and characterize people in organizations. There's more there that's ideological and not actually based in the specifics of people's work.

COS: So can we pause here for a second and relate that back to your initial question of "How enduring forms of social life get constituted and reenacted"?

Lucy Suchman: Right. Well, I guess the theme here is about the constitution of differences within organizations. And in particular, differences based on attributions of differential knowledgeability. There were a lot of things that followed from that. People are compensated very differently; people are valued very differently.

COS: Based on?

Lucy Suchman: Based on deeply held stereotypical assumptions about differences across organization members. I'm interested in how those stereotypical characterizations get sustained, and then how they can be interrupted. First we need to recognize the areas where we are reproducing stereotypical differentiations that we then might be interested in questioning. There may be other distinctions too; I'm really interested in kind of challenging the prevailing --

COS: Wisdom.

Lucy Suchman: -- wisdom about that, exactly. When we started and you said I should feel free to diverge, I knew that we'd reach this. I've told the story of my career path before, and these thematic issues and interests always come up, and then I sort of follow them off and --

COS: Sure, sure.

Lucy Suchman: It never really goes chronologically. So after I did my study of office work, then I got very involved in the idea of --

COS: Can I ask a question? We always take some little rabbit trails here. Now when you came up with the research results you just described, you did a feedback session of some kind. What was the reaction that you got?

Lucy Suchman: Let's start back with that first little project in the accounting office. That was my first project here, and I was a student and very new to the place. I think people, as is still the case, understand in a variety of ways what the implications are. Some people were very intrigued by this and very interested. Part of what was going on was that the office automation

group I mentioned before really picked up on my arguments, they really liked them, because to them the argument that office work was knowledge-based was great. It justified the value of knowledge representation, moving from more procedurally based models of offices to more knowledge-based models of office work. So that community picked up on what I said.

COS: And the practitioners?

Lucy Suchman: In the office?

COS: Yes.

Lucy Suchman: First of all, they were completely perplexed at what I could possibly be interested in. Our experience has been that the first challenge for us is to convince people that we are not efficiency experts, we're not doing time and motion studies. There is such a strong history of work research as being about evaluating your competency, or how well you're doing your work, how fast you're doing your work. So similarly in the accounting office I had to convince people that I was not evaluating how they did their work. I was assuming that they were competent practitioners and I was trying to understand what it was that they actually did. I was recording because I knew that what they actually did was in the details. I would never be able to see or recover those just by watching it go by.

As I started to develop my argument, I conveyed to them that I was trying to make the knowledge and the judgment that was involved in what they did more visible to people who were developing technologies that were meant to ultimately be used in the kind of work they were doing. And that I was trying to convince those people that they needed to approach the development of those technologies in a different way, in a way that was more oriented to the knowledge and the judgment they had. People are very receptive to that, and appreciative of the fact that you engage with them around aspects of their work that they know are challenging and that nobody else ever talks about. They all know about it but nobody else does, and to have somebody come along and be interested --

COS: Nobody else is appreciating.

Lucy Suchman: Yes. I've had a very good relationship with those people ever since and I think it's based on respect. The thing that people are most anxious about is whether you're going to do a respectful treatment of their work, and if they see that you are, then it's fine. Everybody I know who studies work reports that people just love to talk about their work, because people love to talk about the things that they really know about. There are many people who don't have much opportunity to do that. On the other hand, I also published a paper based on that project in the "Transactions on Office Information Systems." And, of course, I don't think they ever actually read that paper or would have been particularly interested in it. So my experience was that you're doing translations invariably of what you're learning and that's fraught with all sorts of difficulties and responsibilities and everything.

COS: So the research process was relationship building, not the output of the research.

Lucy Suchman: And the argument. Because the output of the research was this argument that these people weren't just blindly following procedures, they were struggling with cases. It was a form of case-based work. They were working with cases that were more or less difficult, and they had to make these cases accountable to the policies and procedures: That was what their work was about. Although they never would have formulated it that way if I'd asked them, they all said yes that's right, that's what our work is about. They would have said, "Oh, I just process expense reports."

I then got increasingly involved with the AI community, and with the idea of intelligent interactive interfaces, which was very much a central focus at the time. There was a project here—and that's a whole complicated story that I could go into if you want to, but maybe we should just mark it and come back—that led to the study that became my dissertation and then was published as *Plans and Situated Actions*. It was a study of the kinds of assumptions about action and communication that were being developed within the AI community at the time, and that were the basis for developing expert systems and intelligent interfaces. I was trying to question a lot of those assumptions and develop a kind of an alternative argument. It was building on a similar kind of argument about the relationship between instructions and the actual work of operating a machine.

COS: Yeah, and the argument is?

Lucy Suchman: I was looking at the problem of figuring out how to operate an unfamiliar machine. This actually came out of a practical problem that was brought to PARC from some people in Rochester in Xerox. They had put out a big photocopier, and it was having tremendous problems in the marketplace. People were complaining that it was too complicated and they couldn't figure out how to operate it. That led to a project where my colleagues here decided to build an expert system that would replace the various instructions that went with the machine. This expert system would instruct people in how to use the machine; it would be like having an intelligent coach next to you as you were trying to operate the machine. It would give you useful advice and tell you what to do.

I ended up doing my dissertation about their project, on the assumptions that were built into the expert system, and then what happened when people actually tried to use the machine with the expert system as a coach, and the kinds of persistent problems that didn't go away. This interface was based on a planning model of AI, that what people are doing when they're acting is they're carrying out a plan. They have a goal and then they develop a plan for how to get to the goal and they implement the plan. The expert system was basically trying to anticipate the goal, like if you want two-sided copies of a hundred-page paper, then here's the plan you have to follow. And then it attempted to track people.

COS: Like a never lost system, right?

Lucy Suchman: Right, exactly. Of course, all sorts of difficulties arose. I was arguing that the planning model doesn't really capture how it is that people get from Point A to Point B. Definitely people make plans, they refer to them, plans are useful in all sorts of ways. But just as in the accounting office, where I argued that the policy and procedure manual didn't literally tell you how to process an expense report, the plan for how to make two-sided copies, or whatever, doesn't literally get you from here to there. It's something that you refer to along the way, but you have to actively bring it to bear on the circumstances that you're confronting, and that's what people were doing. The expert system had such a limited access to what people were actually doing that it was unable to follow their actions just by assuming that they were carrying out this plan.

The dissertation had a lot of implications for AI about how we think about relations between instructions and carrying them out, about action and communication. The assumption in AI at the time was that the way we understand each other is that I infer your plan, and then once I've inferred your plan I can make sense out of what you're doing. I was arguing that it doesn't work that way, that we're very actively co-constructing where we're going, whether we're making sense to each other. I was drawing on a large number of resources and very strongly from ethnomethodology. These are basic arguments from ethnomethodology. There was then, and still is, great work going on in ethnomethodology and in conversation analysis on human interactions. Charles Goodwin at the time wrote a book called *Conversational Organization*, which showed how people actively co-construct a single sentence. When I'm talking to you, you are not simply receiving the signals. I'm constantly monitoring how what I'm saying is being received and modifying it. So there's a much more dynamic and contingent character to the way that human activity is organized than the AI models were assuming.

COS: So you destroyed the illusion.

Lucy Suchman: No, I'm afraid the illusion was more robust. But I think I put a little monkey wrench into the works. Definitely it had a lot of impact. Again, because I think it resonated with internal debates that were going on in the AI community at the time. I think of it as there was this thing with a very strong forward motion, and I kind of tripped it up, so that people had to stop and think a little bit harder about what they were doing and consider some alternatives. I tried to provide them some alternatives, other ways of understanding what was going on.

COS: How did that impact the work here at PARC? Was that picked up by the --

Lucy Suchman: It's more like you play in and sort of resonate with what's there. It's like what I was saying at the beginning of the interview about finding what's going on in the indigenous community. In this case there were major things going on in the AI community. There were people like Phil Agre and David Chapman, who were doing technical critiques of the AI

planning model. When they heard about my stuff they loved it, because it was supporting the technical critiques from a completely different direction. And similarly I was really excited to hear what they were doing, because they were able to do a kind of insider critique that I couldn't do. There were real affiliations between our arguments. And then also, I think, it certainly resonated with things that John Seely Brown was thinking about and Jean Lave around the same time.

COS: Is Jean affiliated with PARC?

Lucy Suchman: No. For a short time she was involved with the Institute for Research on Learning, which came out of PARC. But that was only briefly at the very beginning of IRL. John knew Jean from Irvine, and Jean and I are very good friends. Jean was doing her critique of cognitive psychology without any real orientation to AI at all, yet there was all this resonance there. So there were a number of things going on that were coming together at the time.

COS: And now we are in the early 80s?

Lucy Suchman: Yes, the early 80s. That was a really interesting project looking at what happens in the encounter between person and machine, and how it is and is not like encounters between people. But I got increasingly concerned about the idea of looking at people using technology in the actual work environment. So the project I just described was based on getting one of these big copiers here, hooking the expert system up to it, and having a bunch of people come to use it. They ranged from my colleagues to less technical users. We had done some studies seeing people trying to use this copier in real work sites as well, but I got more interested doing something ethnographic. If we're interested in a particular kind of technology, we've got to understand it in the environment of its actual use.

Serendipitously, around that time PARC struck up a research partnership with Steel Case Corporation, and I got a large grant from Steel Case to go out and do a workplace study. I was able to hire some wonderful people, including Charles and Marjorie Goodwin, and Gitte Jordan, another anthropologist who subsequently came to work here. Just a really great bunch of people. I also had a lot of wonderful consultants like Jean Lave, who came in and did intensive consulting.

COS: Was that an established community? Where did you know them from?

Lucy Suchman: I knew them from all over the place. I knew the people in ethnomethodology and conversation analysis from my graduate school days, and from my ongoing connections to people through graduate school. I met Jean through John Seely Brown, and we became very good friends. I had a chunk of money that made it possible to actually bring together a substantial enough team to really do a project. We spent about three years studying ground operations of the San Jose airport. The rationale was to look at a technology intensive multi-activity worksite. It was a very open-ended basic research project about developing our methods and our theoretical frameworks for thinking about technologies in use, and relations between work and technology. We did that project looking at the interactional organization of the work. This is all the work that goes on around a plane when it's actually at the gate.

It turns out that all the airlines have what they call "operations rooms" at the airports where they're operating, which are central locations that coordinate all of the work of ground operations. They're really interesting from the point of view of technology-intensive, distributed, collaborative work. You have a small work group in the operations room working closely together, but the division of labor is such that they're all orienting to other people in other locations, to the gate agents and the baggage people and so forth. The interactions of those people are mediated through all sorts of communications and computing technologies and documents. It was a really rich site for looking at a whole range of issues around the use of technologies, divisions of labor, and the accomplishment of work. This work was interesting because it had to be done—they were working to a schedule, it was very performance-based, dynamic, very interesting. That was a great foundation.

In '89, at the latter stage of that project, I was able to form a research area here called "Work Practice and Technology." We did a series of projects where we tried to carry along what we'd learned about doing that kind of ethnography of technologies in use and the organization of work, but get more of a change agenda involved. I also became very strongly connected to

the Scandinavian research community -- It was based in academic computer science, but had much more of an information systems development focus and a very strong orientation to participatory design, to actually developing technologies in the kinds of work sites where they were going to be used, in cooperation with the people who would eventually be using them. That was tremendously exciting because it gave me a way to move from being a critic to having a proactive alternative agenda which said, we can really develop technologies in a way that's informed by these kinds of studies, and here's a model for how to do that. We did a series of projects where we actually developed prototypes of systems to support document related work. The project that we're doing now is with a civil engineering team at Caltrans in Oakland, who are building a bridge. We're developing a prototype electronic repository for some of their critical documents.

COS: Could you describe one of these projects just a little?

Lucy Suchman: Sure. Right now we're working with an organization that's chosen to be representative of an important market segment for Xerox. There's a lot of interest in state agencies, the public sector, and Caltrans is a big customer for Xerox. We tried to combine spending a lot of time with this engineering team, just following them around and understanding all of the dimensions of their work, with identifying this particular application area where Xerox's product line, current and future product line, could have a critical place. That's the question of how you take collections of documents that are currently kept on paper like in filing cabinets, that you really care about, and move them online.

At Caltrans, every engineering team is responsible for their project files, which is a cumulative collection of the documents created and received over the course of a project. These are mostly business documents, not so much the engineering drawings, but letters, memos, reports, permits, just the huge amounts of documentation that are involved in a big engineering project. They're currently kept on paper in three-ring binders. We've developed a prototype of an electronic project file. We've had to figure out how is the scanning actually going to get done. What sort of scanning interface do they need? What kind of coding interface do they need? What kind of search interface do they need? Now they have an intern who works several days a week maintaining the files. We've got about 2,000 of their project file documents online, and they're putting new ones in as they come in. We've given them a nice Web-based interface to assign various kinds of descriptions to the documents to search for them, both view the document images and do searches.

The argument is that insofar as Xerox has technologies that are critically positioned as portals between the paper and the electronic worlds, that then do various kinds of useful things to the scanned images, then this prototype demonstrates the value that the kinds of hardware and software systems that we're actually developing can bring to these kinds of collections. What we're calling working document collections, relatively small scale individual and work groups' collections, are everywhere in organizations. The question of how to begin to integrate these paper collections with the growing amount of digital online documentation is a really important one for everybody. Providing good software services that interprets the paper to the digital media is a sort of critical niche, and one of Xerox's traditional strengths. So our projects have become aimed at maintaining an ethnographic commitment to doing workplace studies, but then incorporating into those projects these small system development projects that are geared to feeding back into Xerox's heartland product programs. We've been going back and doing workshops periodically with the office document products division in Rochester where we report on what we're doing, what we're learning, what technology we have configured.

COS: So you're co-developing these prototypes?

Lucy Suchman: Right. And the reason that we're able to do this is that for ten years now our group has had not only anthropologists, but also computer scientists. Having such a team allowed us to actually build things, and that made a tremendous difference. How directly we can bring the things that we learned to bear on technology development is not just kind of general recommendations, but is actually --

COS: Co-creation.

Lucy Suchman: -- manifesting it in a working system. It's been very helpful in our conversations with technologists. It's also been really interesting for us to be able to do that. It

actually forces you to deal with things in ways that if you aren't actually trying to build something, you could just wave your hands about. It sharpens it in interesting ways. It's been a very exciting way of working for us that we've come to value a lot, and could take a lot farther. It's very hard, still, to find places within technology production establishments where this kind of thing can happen, because standard product development cycles are set up so that developers aren't interrupted by the customers.

COS: Or by reality.

Lucy Suchman: Right. And however much people give it lip service, and in some ways really believe that they need to have closer relationships with their customers, the people who are going to be using the technology are the ones who really are not here. It's kind of a struggle to create the space for that to happen. It's just extremely difficult.

COS: Even at PARC?

Lucy Suchman: Oh, yes. Even at PARC --

COS: I mean, outsiders would think it's really true what you say, but then there are places like PARC where everything is different.

Lucy Suchman: The research world, as much as the development world, is set up to be self-referential. It's really hard for even the most well intentioned people here to get themselves outside of PARC. It takes time, it's complicated, you have to build relationships, it's a real investment. And it's so much easier just to be right here. There is also a PARC tradition of build what you use, use what you build, that comes out of the computer science lab here. Which is, in many ways, a great idea, but it supports the idea of taking PARC itself as the environment in which to do these things.

The other thing is implementation. As a researcher you aren't really rewarded for carrying out all of the additional work of really getting something implemented so it's usable. So there's a constant tension of whether people are going to make that investment or move on to the next project. I've come to have a much deeper appreciation for how much of a change this really implies for the whole research and development world. Back to this thing of how enduring arrangements get reproduced: when you have things that have been done in certain ways for a long time and the interconnections are so complex, it's very, very difficult to do substantial rearrangements of how this kind of work is done. What the incentives are, what the rewards are, and what the time frames are.

Our recurring experience has been that we do these projects and we talk to people in the product organization. They get tremendously excited. They say this is great, we've got to work together, and then they disappear. And that's because they get sucked back into the immediate demands of work, or they get reassigned. It's partly the short time frames, the tremendous instabilities. I think the loss of productivity in American corporations due to change is enormous. It's due, ironically, to change agendas that actually end up de-stabilizing people and breaking their relationships. That makes it impossible for them to carry through on projects, leaving them in a situation where they then have to completely reorient and start over. I know these things are done in the interest of trying to improve, but I think in many ways it's tremendously --

COS: Dysfunctional.

Lucy Suchman: Exactly. We've had a lot of experience in that. You make a great connection and then the next thing you know, that person has a completely different job.

COS: So how did this new dimension of your work over the last decade change your relationship to the research subject?

Lucy Suchman: Well, again, I find this to be very consistent to what's been going on in my field in anthropology. Within anthropology, the whole kind of objectivist stance of the researcher has been abandoned. It's seen more as a relationship where parties differently positioned in the world are coming together, and what you do has as much to do with where you come from as it does with the site where you're doing your study. It's really about trying to work these worlds together in some interesting way. So I very much see what we're doing at Caltrans as an attempt to create an interesting alignment between their work and our work,

and have something come out of that that's of mutual interest. At the same time, we spent a lot of time watching what they do, sitting in on their meetings, sitting with people while they're working, interviewing people. And they're not reciprocating, they're not doing the same thing with us. So it's asymmetrical in that way. We talk about some dimensions of the project with them more and some less. From their point of view, the real focus of the project is the prototype that we've been developing. But meanwhile I'm fascinated by the public hearings that they have as part of the environmental process, and the way they work with this computer, and the design and all of that. I've been writing papers about that, publishing them and delivering them to other research audiences, non-technological research audiences. I think they know that we're anthropologists, and so they basically know that we're interested in more than just their project files, but in how the project will fit into the whole range of work that they do. But because we're all writing and speaking to multiple audiences, you design what you're doing for those different audiences**.** The people who are subjects of your studies represent one audience, but it's very hard to actually translate all of the other ways that you're interested in thinking about their work and talking about their work back into the terms of your interaction with them. I think that's a very complicated area.

COS: What I heard you describing, though, is that - You did change the consciousness of the people who were doing their accounting practices, but probably the way they did their work didn't really change as a result of your study. But now you're really engaging with their practices and their enactment of social reality in a different way.

Lucy Suchman: Yes. That's another really important dimension of change.

COS: But partly you're acting as a consultant, which is being helpful, right?

Lucy Suchman: Yes. And one of the really good things about the way that these projects have been designed is that there's no money exchanging hands. So we set it up as a collaborative research project, and that means that we're trading our time.

COS: Which is based on reciprocity.

Lucy Suchman: It's based on reciprocity. There's an understanding that we're not going to be delivering a full-blown working system to Caltrans. We're going to be delivering a pilot, an experimental prototype. It gives space for exploring that we couldn't have if we were under some kind of a paid contract to deliver a system. I think they feel very appreciative of the amount of time and effort we've put into this project, and they've given a lot of their time in return. And for me it's been such a pleasure to actually be giving them something useful, rather than just hanging around and watching them work**.** Having a real role and actually feeling that we've contributed something that is of value to them is a real relief from the usual researcher position, where you're there because people are kind enough to let you hang around. Yes, we are definitely intervening. When we arrived, they certainly weren't planning to move their project files online, but the organization as a whole, the management at Caltrans was very actively engaged in developing a technology strategy and trying to figure out what it means to start to develop their intranet. They're moving more and more of their operations onto the Web. We're really trying to engage with that ongoing process, rather than coming in and saying "you've been doing things the same way for a long time and now you're going to do them differently."

COS: If we look at the last 20 or so years, what do you consider the major accomplishments and limitations in your field?

Lucy Suchman: Big questions. You know it's interesting to think about my field, what does that refer to?

COS: I would be interested in *your* response.

Lucy Suchman: I can answer it in terms of what I feel that our research group here has accomplished. In many ways we have contributed significantly to opening up some new hybrid interdisciplinary research areas, bringing together work practice studies and designs. A lot of it has been about network building, and I've been living within a very large number of different research networks for the last ten years or more, which I like very much. Just thinking about the conferences that I go to, I go to technology related conferences; computer supported cooperative work, sometimes the computer human interaction conferences. I

always go to the annual meetings of the anthropology association. I'm very involved in the social studies of science and technology community. And there's a participatory design conference now, every other year that I was involved in starting up. I occasionally go to the Academy of Management meetings and in the sociological association. There are a lot of different networks, and I'm really interested in working those networks together, because I care about all of them**.** I'm selfish, I want to be telling all these different stories, and I need all these different audiences to tell them to.

COS: Interesting.

Lucy Suchman: And my identity is very deeply tied to the social studies and science and technology, anthropology community. I've sort of held onto that like a lifeline, because it's very important to me to stay a part of that. In terms of constraints and limits, I think that I really feel that this is an uphill battle and it's getting harder rather than...

COS: Getting harder?

Lucy Suchman: My feeling is that the space for expansive, exploratory learning is closing down in American industry, and there's a kind of intensification going on in competition, in the shortening of time frames, that's really detrimental to research.

COS: Yeah, Wall Street pressure.

Lucy Suchman: Unbelievable Wall Street pressure. Maybe we're in a cycle of a pendulum swing, and it's going to correct itself. I hope so, because I don't see how we can keep intensifying in these ways. I think it's a particularly difficult time. Even though in some ways there's much more openness and interest, and ideas of learning and change, interdisciplinary work, I think the practical and economic realities are that there isn't time for those things, and the forces working against them are much more powerful at the moment than the forces working for them. That worries me a lot, and I feel quite pessimistic at the moment. So the main limits I see are about space and time and the opportunities to pursue the kind of research interests that I've been pursuing. Even though we have and will work hard to make them relevant to the interests of product development, there's a limit to that.

The other thing I worry about is that entrepreneurship is overwhelming everything else at the moment. My colleague Jeanette Blomberg wrote a paper several years ago for the anthropology meetings called "Reinventing the Researcher as Entrepreneur." It was a very wonderful essay, based on interviews. Basically she was exploring the ways in which researchers are increasingly called upon to not only develop new technology ideas, but to do the strategic assessment of their marketability, their profitability, and the competitive landscape. Now I can understand that it makes sense to have the people who have the best and deepest understanding of the technology engaged in those kinds of assessment, but it worries me that we're losing the diversity of roles, of temperaments. I would be very prepared to work with someone who was a specialist in strategy, in market analysis. Or if somebody came to me and said, "We have an idea that this direction is the one we should be going in. Here's where we're going to find the next billion dollar business, or whatever, do you see a way that you could contribute to that?" That would be fine, I'd be more than ready to do that. But I myself cannot make that assessment. I'm not qualified to make it, it's not the career that I chose for myself, and I'm not willing to abandon the commitments that I have.

There are some shifts at PARC that worry me in that respect. One of the things that worries me the most is it's constructed as community responsibility. So we need to abandon our own personal agendas, as they're called, and engage in this new kind of initiative. Just framing it that way, suddenly your whole life, the things that you're qualified to do and the things that you're invested in and committed to, become your personal agenda. Suddenly it becomes you or the community. Setting up that kind of opposition, is one among many kinds of traps that box you into a smaller and smaller space. You can't hold onto your commitments without being seen as oppositional. I've actually been told that I'm resistant to change. My feeling is that the things that I'm resistant to are the things that I see shutting down the possibilities of change, the kind of change that I care about and that I've been working for. The sort of rhetoric around it becomes very, very complicated and it's hard.

COS: From an outside point of view, as we move into the more and more knowledge-based economy, the skills that you represent and that have made Xerox PARC famous, should be

much more in demand than ever before, with profitability analysis or without. So it's a little bit astonishing.

Lucy Suchman: Right. I think it's subtle, and it's more the quality of how we pursue these things. Because I think that alongside the knowledge-based economy has come this intensification in competitiveness, particularly in the software industry, and an increasing orientation to Wall Street and the kind of shortened time frames that that brings about, and the kinds of manipulations that are involved in that kind of orientation. So I think there are some big contradictions here. Rightly or wrongly, there's the conviction that the only way to engage with the new economy is in this intensely entrepreneurial way. I think that works against diversity, it works against long term investigation.

COS: It works against the culture that brought about that whole new economy in the first place, right?

Lucy Suchman: Exactly, yeah. So I think while in principle it shouldn't be the case, the fact is that the way that the terrain is developing has very deep contradictions in it, where the reality works against the rhetoric in a lot of ways.

COS: It's interesting that you say this. I didn't share up front some of the context of the initiative. Though we talked a little bit about the experiential kind of thing and so forth, another aspiration is that we really need an alternative vision to the GE type of capitalism. We need a new way to think about the economy and business, and so forth.

Lucy Suchman: Say more about it.

COS: It's what you just described. It's shareholder pressure and profitability in the short run, but anything else which considers itself efficient, but efficient in what terms and then what time frame. So my question is what would an alternative approach, of how to operate a knowledge economy look like? So far we are just complaining about it—that's not the way we like it, but how do we do differently?

Lucy Suchman: This is something I would want to think about with people who were differently qualified than I am. One of the things we've thought about is that there's a common conception that the kind of ethnographic work that we do is a luxury and that it moves too slowly to have a real input to product development. Our experience has been the opposite. We're always waiting for the products that we want to incorporate into our prototypes, and eventually have to give up and find ways around. Because product development is delayed, is redirected. I think there's an irony there. So the counter-argument, what we've said is look, it's not that we go out and do the study and you wait until it's over, and then we give you the results. We think these things should be running in parallel. So a company like Xerox should have ongoing collaborative relationships with certain of its customers, such that you get the best of both worlds. You get to build the long-term relationship, and people like us would take the responsibility for doing that, for building and maintaining that long-term relationship. We would do that in interactions with people in product development, or people who were trying to do things on short time cycles, and try to keep a dialogue going between the two. So it's setting up more kinds of enterprises that are addressing things in different time frames with different orientations. The trick is to have them engage with each other.

COS: So you would build and design the relationship between them.

Lucy Suchman: As researchers our job would be to develop long term resources. "Long term" in the sense that they are continuous resources, based on being given the space and the time to actually develop deep and extended relationships, understanding, and knowledge, in particular sectors of the industry. For a company like Xerox that's trying to play into multiple sectors, you would have research investment in the public sector. Xerox has just set up industry-based solutions, and that's framed as a move toward developing greater dedicated expertise around solutions and services to particular sectors. At the moment, the infrastructure that's behind it is thin. To realize that, you would have to make the investments in developing the knowledge within your own organization and developing those relationships. Now I don't know what other kinds of initiatives you would also have to be engaged in in order to keep your business successful. That's outside of my realm of expertise. But it seems to me there has to be at least one niche that has that character to it, and that that's a possible research niche.

I have a lot to say about modes of conducting research in an industrial context. I need a lot of collaboration with other people to be able to really work out the business cases and a strategy for that. And that's another thing: there's too little investment in that sort of collaborative strategizing. There are various initiatives in that regard, but they don't quite take hold, for reasons that I don't fully understand. The worlds continue to be quite separate. I think the solution is not to turn all of the researchers into entrepreneurs, but to set up more effective kinds of --

COS: What is it really that makes it such a difficult process?

Lucy Suchman: I don't understand it fully. I think that the sort of polarity of the different worlds is part of it, and that's very difficult to break. We're all operating in these separate worlds and these --

COS: And auto-poietic islands, right?

Lucy Suchman: And the feedback loops on those islands are getting tighter and tighter, and more and more intense. People are increasingly preoccupied with just staying engaged within the self-referential world that they're part of, never mind being able to make connections to other worlds. And of course, part of that is probably also self-reproducing, right? It's disruptive to hear from other worlds, and if you have enough trouble as it is, then the last thing you want is more complication. The shift that has to take place is to come to believe that what you're going to get from crossing those boundaries isn't just more complications, but solutions. When you actually go out and engage with customers, then you discover that you get things that you never could have come up with on your own. It makes your life easier in many ways, and more than repays the kind of energy that's required to maintain the relationship. But if you don't believe that, if you think it's just going to make your life more difficult, then you're not going to do it.

I think it's similar with management and front line workers. The idea is that if you really get input from front line workers, it's just going to make your life more complicated, rather than actually dissolving some of the problems that you have. You might discover that the problems that you think you have are non-problems, and that there are alternative ways of thinking about others. We all have this idea that it's going to be more loss than gain. In some ways it probably is going to be genuinely disruptive.

COS: I'm still puzzled with this picture. The whole discussion of knowledge creation and the new economy is turning towards, at least on an espoused value level, exactly what you have been talking about over decades. Now you are telling me it's getting more and more difficult?

Lucy Suchman: What do you think about the relationship between the espoused and the practiced, or the actual? I think that's a critical piece of this. It may be that those things are diverging. This is a bit of what I was saying before, that there's a simultaneous incorporation into the espoused values of one set of things, at the same time that the world in practice is pulling in the opposite direction. I also worry a bit to what degree the whole preoccupation with knowledge management is as much about good old-fashioned control as it is about anything else.

COS: The Type I ethnography.

Lucy Suchman: The Type I ethnography.

COS: It's certainly true for -- probably not for all, but for a large part of it. So that brings us back to your initial question. If we now look at your whole journey, how did your initial question of how enduring structures get enacted to all of that?

Lucy Suchman: You know, there's this old, "first there's a mountain, then there isn't a mountain, then there is" ditty. And I have a feeling that I've gone through that cycle somewhat myself. At the beginning I thought of corporations as big monolithic black boxes. Having been inside, I see how much more textured and complicated and nuanced and all the rest they are. At the same time I have, more than ever, a sense of the immovability of these institutions. I feel like I understand much more deeply why it's so hard to effect change, but I have no less of a sense of the power of established ways of operating. That's a very simple and simplistic story, and I think part of what you're saying is that there's a very complicated story here

where there are discussions going on in a lot of different venues that are pulling in one direction, and then there are trends and economic and --

COS: Real reality.

Lucy Suchman: Real reality that's pulling in another direction. One of the realest realities being the opportunity to get very rich very fast. As you were saying, that's one measure of efficiency for particular individuals. It's not clear what it means for the society, or for the long term, but I think it's just a powerful, powerful force at the moment. And the whole delineation of an entirely new territory through the Internet. That's just sort of both horrifying and fascinating to me, as having exhausted the frontiers of commerce around the globe, capitalism has invented an entirely new playing field to start the whole thing over again, and with ever greater intensity. So that's the dark side, and obviously there are a lot of other sides to it. It feels like an expansive time to me for certain forms of capitalism, but it doesn't feel like an expansive time more generally.

COS: I absolutely agree with what you said and can relate to that. But then, when you travel around you also see this other more hidden dimension, which is that you have an enormous amount of a new awareness in people and in communities.

Lucy Suchman: What are you thinking of, for example?

COS: One example would be in the field of health. About 40 percent of all patients in the US buy alternative health things and spend an enormous amount of money for that. This is an enacted resistance against the existing system, and it's going on every day. A colleague of mine, Joe Jaworski, who wrote the book *Synchronicity*, and I did an interview study, interviewing entrepreneurs. We interviewed Silicon Valley entrepreneurs and people who accomplished something, who brought about something, and looked at what was it in their lives that gave them access to this type of performance. In each case we listened to their life's journey and what allowed them to do what they did, to do what they do. In each case we heard elements of a similar journey. They were able to access a deeper kind of knowing, which comes from more than just the head. As we move into the new economy, the ability to access this type of knowing within yourself becomes more and more critical. As Brian Arthur says, in an increasing returns competitive environment, being able to decipher the next game first is critically important. In other words, to be in touch with emerging realities and emerging futures now, rather than just to imitate what others already have done.

Lucy Suchman: Right. That's very interesting, because you are pointing to this awareness, which I think is right and really important. To me, that's an awareness of the kind of knowing that comes from experience, and that implies time. It comes to people who have been deeply immersed in something for a long enough time that they've developed a repertoire of knowledge ability about that domain that can't be gotten any other way. So that argues that what people need the most is time to learn.

COS: And a different quality of time, right.

Lucy Suchman: The other thing is actually recognizing that you have that [experiential knowledge] and it is a valid resource to draw on. You shouldn't just be distracted by all of the other messages in your environment about what you should base things on. That you should actually recognize that you have this other basis. Of course, I find a bit of irony or contradiction in the fact that you should do that in the interest of participating in this intensifyingly competitive economy. But if we set that aside for the moment, what I see is a preoccupation with how do we exploit that, how do we capture it, how do we represent it. It doesn't take seriously the implications that people need time, and continuity. It's directly contradictory to the way that organizations are going, as far as I can tell, in terms of this whole thing about how we're all supposed to be constantly flexible and ready to transform ourselves to something completely new. I think it's in direct contradiction. The continuity is the thing that brings this deepening and increasingly powerful foundation. Continuity has been given a really bad rap in the current view. But what you're pointing to is that it's a time of just tremendous contradictions. The fact that all this stuff is sort of struggling around against itself is good. It gives me hope, because I think that's healthy. And I think you're right, that the counter elements are simultaneously there, along with the more discouraging things that I've been articulating.

COS: For my last question, I want to come back to your initial point, but I am rephrasing it with different words. How is it that on the one hand we enact the structures and yet, on the other hand, the structures seem to determine our actions? On the one hand we are victimized by the larger system, on the other hand we enact and co-create this very system in the first place. What determines whether we operate in the reactive mode of being victimized or whether we actively co-create the larger system? Do you know what I mean?

Lucy Suchman: Yes, I do. I find it very hard to say just what the difference is between reproduction and change. In a way you're asking what's the difference between just being carried along, becoming a part of, contributing to the reproduction of previously established forms of life, maybe without even having a sense of that there could be alternatives, right? Or, being engaged with these things in a way that's more—well, I guess I'm formulating an answer to your question. Maybe that is the difference that's important to me. I assume that in myriad ways of which I'm completely unaware, I am participating in the reproduction of the traditional forms of life, for better and worse.

I guess I'd locate my hope in being part of enough different worlds simultaneously. For me it's been very important both to learn what there is to learn here—which I couldn't learn anywhere else—while at the same time holding on to my ties, my relationships, getting input, getting a different kind of perspective and nourishment from these other worlds that I've continued to be part of. Out of that I've tried to find a kind of a nexus of a center where things make sense to me. I carry that with me and try to play off each next thing that comes along against that and say, what does this mean? What can I do with it? In what ways is this a time to take up a new direction? In what ways is this a time to stand firm and just hold on to the things that I care about?

That's an ongoing daily exercise being in a place like PARC. I've tried to model a way of being in this kind of an organization that makes sense to me. It makes sense to me in the ways that it's been formed by all these other worlds that I'm part of. I don't see what else to do, and I think doing that is part of what makes for an interesting cross dialogue or traffic flow across some of these worlds. That might make things clear in some cases, open up new possibilities. I think real change happens through quite subtle and small events, but with large cumulative effects. In some ways I see my ties as a kind of an intervention in a place that would be different if I weren't here, just as I would be very different if I hadn't spent all this time here. That's going on all over the place for different people in different ways. I'm obviously a strong believer in the importance of time, that things take a long time. The most valuable thing that I've had from being here has been the opportunity to develop some really long-term work relationships and collaborations. I know from my friends who are in academia that it's very rare to be able to engage in the kind of day-to-day, long-term collaborations that I've had with people in my research group and other people at PARC, and other people in other parts of Xerox.

COS: As I heard you, the picture that came to my mind is that our social world has two modes of operating. The first mode consists of highly fragmented autopoetic islands. Every system is totally decoupled and blind to its environment. And every individual lives in one and only one system. The other mode operates based on the primacy of relationships. The social worlds are interconnected and each individual participates in multiple worlds or systems. People are the nexus of exchange, where one world is relating to another one, or becoming another one. Your work and your identity are really about being this nexus, making these connections and allowing one world to slide into another and return.

Lucy Suchman: That's a very nice way to put it.

COS: And that the current system of mainstream capitalism talks—on the level of espoused values—about this exchange, becoming the other, but the real structural pressures that we encounter work against that. Thank you so much.

Lucy Suchman: Thank you. That was a wonderful summary.