

# 1. Work as a (Global) Practice

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## 1.1 Work as Practice

In this chapter I review an approach to studying work that I call “work as practice.” (I borrow the term from Orr 1996, the last of the authors I review in this chapter.) In doing so, I aim to construct a foundation for a later discussion of how a technical practice such as software development spreads and stays synchronized across space. The literature that I bring together under the heading of “work as practice” shares important insights, as it looks at work as intertwined with individual identities and membership in social groups. At the same time, the literature brings together several theoretical traditions, with two being of particular importance: the Chicago School of Sociology (exemplified here most clearly by Hughes and Becker) and the Marxist theories of practice (exemplified by Lave & Wenger, 1991). My synthesis relies on the Chicago School tradition as the basis, bringing in elements of the theory of practice to the extent that they become necessary. (One of those elements is the concept of “practice” itself.) I do so in part because I find that the down-to-earth approach that characterizes the Chicago School fits more naturally with an ethnographic project than does the often highly abstract discussion of practice theory. This approach also helps me link my project with a longer tradition of studying modern work ethnographically.

I present in this chapter a conservative synthesis of the existing literature, aiming to organize it, to discuss some its problems, and look at some of the solutions to those problems, arriving at an approach that I believe is defensible against the criticism to which some of the work in this tradition has been subjected. I do not aim to *extend* the theory of “work as practice” in this chapter. In the two chapters that follow, I subject this synthesis to my own criticism—for failing to provide a theory of practice in space that would work at a world scale. I do so first by presenting ethnographic observations that challenge the initial theory (chapter 1.2), and then by providing a theoretical critique and proposing a resolution (chapter 1.3), drawing on additional ideas from practice theory (Giddens in particular). Parts 2 and 3 of the dissertation then illustrate and expand the theory presented in chapter 1.3.

I present my review chronologically, starting with 1950s. The reader may wonder if books written half a century ago can help us understand such modern occupations as software development. I intend to show that they do, in three ways: by reminding us of certain ideas that

are too often forgotten, by putting more recent literature in perspective, and by showing the ways in which peculiarities of software development represent not a break from the past, but rather a radicalization of phenomena observed for many decades.<sup>33</sup> I also believe that understanding the ideas expressed by the earlier authors, allows us to focus on the specific contributions of their intellectual heirs. Putting each author in their historical context also makes it easier to see how their writings respond to the challenges leveled at their predecessors.

An important problem that has characterized some of the literature in the “work as practice” tradition is the insufficient attention to the economic side of work. Many kinds of modern work cannot be understood without considering them as a form of cultural practice, that is a system of activities that is linked with the collective of people who engage in such activities and which cannot be understood without considering how individual practitioners become members of this collective, how they establish their claims to membership, and how their membership interacts with their identity. As I argue in chapter 2.1, for example, the work of software developers cannot be understood without considering the developers’ identity as “nerds” and the process through which they become “nerds.” At the same time, however, it is important to avoid looking at work as *just* a matter of culture. Work is also a form of participation in a system of production and is entangled with *economic* relationships. Such relationships are nearly always invested with power and the goals of the workers may not always align with those of the organizations that employ them. I refer to this aspect of work as “work as labor.” Authors writing in the “work as practice” tradition have been often accused of politico-economic naiveté by those of the “work as labor” conviction (e.g., Braverman 1974). I take this charge seriously and attempt in my review to show where the literature on practice may in fact be guilty of ignoring the “labor” side of work, point out the places where this side is acknowledged and incorporated, then bring out and expand those elements. As I attempt to show in the later chapters, using software development as my case, work must be understood *simultaneously* as a matter of both practice *and* labor. Such simultaneous analysis is especially important for understanding how practice is reproduced in space, since the reproduction of labor relationships may either run ahead or fall behind the reproduction of the cultural practice.

## From Knowledge to Practice

Software development is often described as “knowledge work,” and sometimes presented as the quintessential example of it—something that can help us understand other types of modern work. The immaterial, informational elements of software development are easily apparent and are quite clearly important for understanding globalization of software work. In this chapter and this dissertation, however, I take a different approach to software development, looking at it as *practice*. Such approach does not reject the importance of knowledge, but avoids reducing software work to manipulation of “knowledge.” I do so out of a belief that such

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33 I borrow the concept of “radicalization” from Giddens (1990), who presents a more general argument that the social transformations of the recent decades are best understood not as an advent of a new era of “post-modernity,” but rather a “radicalization of modernity.”

reduction inevitably proceeds to further reduction of “knowledge” to “information” and then to a purely informational understanding of work. The concept of “practice” helps us buttress against such a reduction. The rest of this section briefly reviews some conceptualizations of knowledge and presents an argument for looking at “knowledge work” as practice.

Modern understanding of knowledge is strongly influenced by what has been called the “codification view” of knowledge.<sup>34</sup> This tradition, which goes back to Diderot and other Encyclopedists of 18<sup>th</sup> century, has stressed the understanding of technical knowledge as a collection of reproducible facts and techniques. Under this “codification view,” knowledge possessed by skilled artisans can—and should—be converted into textual form to then be made available to all who need it. New information technologies developed in the 19<sup>th</sup> century (such as microfilm photography, developed in 1839), inspired by the end of the century a wave of excitement about the potential for reproduction and free dissemination of knowledge, led by the Documentation movement of Paul Otlet (e.g., 1925/1990) and supported by figures such as H.G. Wells (1938). Some of those ideas were later popularized by Vannevar Bush in his articles on *Memex* (e.g., 1945), and went into the Rapid Selector (Shaw 1949). With the diffusion of the digital computer after World War II, the dream of freely reproducible knowledge started to take a concrete shape. Work of early information retrieval researchers such as Luhn (e.g., 1961) and early networks researchers (e.g., Davis et al, 1967) laid the foundation of what we now know as “googling.”<sup>35</sup> Doug Engelbart’s 1962 report and Ted Nelson’s visions of Xanadu (a hyper-text system later described in Nelson 1974/1987) provided a revised version of the Memex. The spread of Internet access and the development of the World Wide Web technologies in 1990s made this view even more appealing. In my own interviews with software developers, questions about how they learn what need to know to do their work often led to the same short response: “the Internet.”

The codification view of knowledge has been quite influential in economics and business. Since Drucker’s (1969) realization that of the effect of knowledge and innovation on productivity and long term development, there has been growing interest in understanding how knowledge could be “managed.” While business literature on knowledge management has sometimes acknowledged the fact that knowledge cannot be fully reduced to information in computer files, much of it bears the imprint of the codification view. When the work of Paul Romer (1990, 1993), established knowledge as a legitimate topic in economics, it brought with it a codification perspective on knowledge.<sup>36</sup> Romer’s discussion focused on the sharing of “designs,” which he

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34 The term “codification” is common today, see citations later in the text on the discussion of “codified” vs. “tacit” knowledge. The term “codification” was introduced by Polanyi (1966). This approach is also sometimes known as “the conduit metaphor” (Reddy 1979). See also Lakoff & Johnson (1980) for a discussion of the conduit metaphor as a metaphor.

35 Needless to say, information retrieval and networking are but two of the many technologies that go into making the modern Internet experience possible. However, many of the other important technologies (e.g. hard drives) become available in roughly the same time frame.

36 The topic of knowledge was largely ignored in economics until the 1950s, at which point it entered the literature (e.g., Schmookler 1954, Solow 1957) but remained quite peripheral until the early 1990s. (The two widely cited papers on knowledge by Hayek—1937 and 1945—deal with actors’ knowledge of the market and the knowledge carried by the market itself, rather than technical knowledge.) In 1965 Schmookler writes (p.

described as “non-rival”—that is, in principle usable by any number of people at the same time.<sup>37</sup> Consequently, in Romer’s (1990) view, designs/knowledge “can be accumulated without bounds on a per capita basis” (p. S75)—an assumption that established a new paradigm for economic treatment of knowledge.<sup>38</sup> Romer then argued (1993) that the misfortunes that afflict many countries would be best understood by considering the “idea gap” between them and the more successful countries like the United States. Such “idea gaps,” Romer argued, are “relatively easy to solve,” and consequently “idea gap explanation for persistent poverty offers a more optimistic picture of the potential for rapid development” (p. 546).<sup>39</sup>

The increasing popularity of the codification vision led to a critique of this view. The

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During the last dozen years or so economists have shown that the production, diffusion, and use of new knowledge are more important to the growth of output per head than is the accumulation of physical capital. It seems safe to say that the discovery occasioned more surprise among economists than among educated men generally. The differential surprise is an instructive example of how damaging to the understanding professional knowledge can be sometimes.

After brief excitement about knowledge in 1960s, however, it was abandoned as a topic of research once again. For the discussion of the marginal role of knowledge in economics in 1970s and 1980s see Romer (1990).

- 37 More precisely, Romer (1990) argues that “designs” are non-rival (i.e., any number of people can be using them at the same time without cost to each other), but potentially *excludable* through an artificial mechanism of intellectual property protection—people can be banned from using knowledge by legal means. They are thus not a pure “public good” since traditional public goods (such as clean air for breathing) are both non-rivalrous and non-excludable.
- 38 Of course, while in principle knowledge is reproducible without limits, such reproducibility can in reality be limited by law to allow creators of knowledge to earn money by selling rights to reproduction. Economics of innovation often works with an assumption that no innovation would happen without such monetary incentives and that use of innovative ideas must thus be restricted by law. (See Gallini & Scotchmer 2002 for a discussion of prizes and contracts as alternative to intellectual property.) This is a point at which the economic and the technological visions of knowledge split paths, since many proponents of the engineering vision have increasingly stressed the creation of replicable knowledge “just for fun.”
- 39 The persisting patterns of inequality (which continue today, years after Romer’s paper), present an obvious problem for this optimistic view—a problem that Romer does recognize and address briefly. One of the reasons he mentions is the possible lack of “the basic institutional infrastructure required for market exchange” (p. 547). The recognition of the importance of “infrastructure” is an important insight, similar to Latour’s (1988a) discussion of “tracks” on which knowledge travels (see below). Romer, however, trivializes the idea of infrastructure, treating it as a singular hurdle and suggesting that ideas are easily replicable once some *basic* infrastructure is achieved. Romer’s second explanation (which he stresses as more important) is “an aversion in some developing countries to any contact or exchange with firms from industrial economies” (p. 548). While this may be true of a small number of countries (and may have been true of a larger number in the past), I believe such “aversion” is less common than is often assumed. Even in case of Brazil, a country notorious for its protectionist policy in regards to information technology, it would be wrong to talk about an “aversion” to exchange with foreign firms. As I show in chapter 2.2, Brazil’s protectionist policy should be best understood not as an attempt to isolate the country from foreign firms and their knowledge, but rather (among other things) an attempt to *buy* technical knowhow from those companies that were willing to sell it, offering select firms access to the Brazilian as a form of payment. (Note that Brazil lacked money to pay for “knowledge” directly and the major computer companies, e.g., IBM, were not interested in selling their know-how anyway.) Even if we see protectionist policies of 1970s and 1980s as a sign of “aversion” rather than as a matter of haggling over

question of whether all knowledge can actually be codified in principle (apart from the technical issues of storage, retrieval and transmission explored by engineers) first attracted the attention of philosophers. Ryle (1949) proposed a distinction between “knowing that” and “knowing how,” and Polanyi (1952, 1966) introduced the concept of “tacit dimension” of knowledge, arguing that “we know more than we can tell” (1966, p. 4). The idea of tacit knowledge was then developed further by scholars in the Science and Technology Studies tradition, such as Collins (1974) who looked at the diffusion of knowledge regarding a laser design (and later, in Collins 2001, at the difficulties experienced by British physicists attempting to replicate a Soviet experiment), and MacKenzie & Spinardi (1995) who discussed “the uninvention of nuclear weapons” in the United States. Some of the discussion of ‘tacit knowledge’ focused on the simpler observation that communication always relies heavily on prior common ground and typically references the physical environment.

The term “tacit knowledge,” however, suffers many of the shortcomings of the codification view of knowledge. The use of the word “knowledge,” a noun, positions tacit knowledge as another type of “knowledge,” somewhat of an evil twin of the “normal” (codifiable) knowledge. (See, for example, Cowan et al. 2000.) The term “tacit knowledge” invites us to continue thinking of knowledge as a “thing” and something an individual (or a group) can “have.”<sup>40</sup> Yet when we ask where it is, tacit knowledge proves to be an illusive, mysterious concept. Additionally, while authors who argue for tacit knowledge typically introduce a distinction between “knowledge” and “information,” such distinction is often forgotten or employed inconsistently when the ideas developed by those authors are popularized. I suspect that the term “knowledge” is today so strongly connected to the idea of replicable designs and electronic transmission of files, that I cannot expect my reader to simply put those associations aside.

Instead, I use a different term, and look for a different theoretical foundation. I find such a foundation in the work of Becker (1953, 1972), Lave & Wenger (1991) and other authors discussed below, and systematize it using Lave & Wenger’s term “practice.” I define “practice” as a system of activities, a collective way of doing certain things. Understood this way, “practice” subsumes both tacit and codified dimensions of knowledge. In this process, “tacit knowledge” disappears as a distinct category. That is, I do not find it useful to draw a distinction between “tacit knowledge” and “practice” and limit myself to saying that “tacit knowledge” is a part of practice. In contrast, knowledge codified in documents becomes highlighted as an *element* of practice—an important one, yet one of many. I focus on what people *do* and how they come to change how they do things, and then approach the specific knowledge-processing activities—such as reading, writing, and other forms of communicating—in *the context of this doing*, considering them side-by-side with the many aspects of practice that cannot be reduced to

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prices (or of attempting to reproduce at home what was simply not available for sale), such policies are now in the past. Since the early 1990s, it would be hard to see any signs of aversion to foreign companies or their technology in the Brazilian government. The same is true of software professionals, who in fact often appear more interested in learning about technology developed abroad than about what happens in Brazil.

40 As Duguid (2005) points out in responding to Cowan et al. (2000), Polanyi (1966) argues for a tacit *dimension* of knowledge, rather than for “tacit knowledge” as a type of knowledge. Ryle (1949) similarly talks about “knowledge that” and “knowledge how” as interdependent.

acquisition of information.

Looking at practice rather than acquisition of knowledge, however, means more than just looking at what people *do*. To follow Becker (1953, 1972) and Lave & Wenger (1991) is to recognize that practice is a deeply collective and relational phenomenon which transforms the individual, making her or him a member in a collective of practitioners, enmeshed in a new web of relationships. Looking at engineers, for example, it is not sufficient to ask how someone acquires the knowledge of engineering or starts to engineer things. Instead, we must consider the full implications of *becoming an engineer*—the individual’s entry into a network of socio-technical relationships, which will transform how they see other people, objects and themselves, and how others will see and interact with them. Learning, according to Lave & Wenger, is “the historical production, transformation and change of persons” (p. 51). Such “relational view of the person and of learning” (p. 53) implies that “activities, tasks, functions, and understandings do not exist in isolation; they are part of a broader systems of relations in which they have meaning” (p. 51). To understand practice and learning, we will therefore have to look at them in the context of such broader systems, considering also how the participants themselves reflect on those broader systems. This view also implies that newcomers do not merely acquire the knowledge that was out there before they arrived, but rather become a part of a system, changing it by their very arrival.

The argument that learning must be understood as a matter of progressive engagement in a community of practitioners was most famously presented in Lave & Wenger’s (1991) *Situated Learning: Legitimate Peripheral Participation*.<sup>41</sup> This important book has been widely read in a number of different fields, and interpreted in a number of ways. I look at Lave & Wenger in the context of a particular tradition, the “Second Chicago School” of sociology,<sup>42</sup> which I believe gives it its fullest meaning, while also helping us see the work’s most important limitations. While certain important elements of *Situated Learning* do not fit in this tradition, looking at Lave & Wenger in connection with the (second) Chicago school makes it possible to link their theoretical discussion to a wider body of ethnographic work, as well as to very similar theoretical accounts.

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41 As was suggested in the previous section, this argument involves two analytical moves: the change of focus from acquisition of knowledge to practice, and from practice as something that people *do* to something of which they *become a member*. Both of those moves are necessary, since making the first move without the second merely replaces a cognitivist explanation with a behaviorist one. Lave & Wenger then make a third analytical move, from practice in the narrow sense to practice in the “historical, generative sense,” which I will discuss below as well.

42 Fine (1995) uses the term “Second Chicago School” to refer to the generation of sociologists associated with the Department of Sociology of University in Chicago in the decades following the end of the World War II, whose interests, theories and methods differ substantially from those of the pre-war Chicago School tradition (most strongly associated with Blumer, who left the University of Chicago for Berkeley in 1952, and Park). As other contributors to the volume, Fine cites Howard Becker, Erving Goffman and Anselm Strauss as the most prominent icons of the “Second Chicago School,” pointing to the importance of Everett Hughes as the linking figure. (Hughes was a student of Park and a mentor of Becker, Goffman and Strauss.) Coser (1994) attributes to Hughes the same role. John Van Maanen, Stephen Barley and Julian Orr do not belong to the same cohort of sociologists (nor are Barley and Orr “sociologists” in the narrow sense of the word), but their work fits closely in the tradition of study of work started by the “Second Chicago School.”

In this chapter I review the work of Hughes, Becker, Van Maanen & Barley, Lave & Wenger, and Orr, providing my synthesis of their respective theories of work and practice. (Later, in chapter 1.3, I also incorporate some insights from the work of Anselm Strauss and other authors who contributed to the Chicago school literature on “social worlds.”) While discussing their respective takes on the relationship between learning, practice and communities, I consider the fact that they use different terms to talk about similar, but not identical, concepts. Hughes writes of “work” or “occupations” (1958), Becker of “activities” (1953) or “groups” (1963) or without using any technical terms at all (1972),<sup>43</sup> Van Maanen & Barley (1984) talk of “occupations,” Orr (1996) or “work” and “practice,” and Lave & Wenger (1991) talk of “practice.” “Work,” “occupation” and “practice” are distinct but intertwined concepts. I look at work as a kind of practice, and one of the most important ones to study, since work is in many ways central to the functioning of society (see the discussion of Hughes below). Yet we cannot fully understand modern work without looking at how it relates to other types of practice—those that we would hesitate to call “work”—and understand what it has in common with those practices. In case of software development, we must find a way to account for the fact that some of the world’s most important infrastructure today runs on an operating system much of which was written either “just for fun” or out of moral calling.<sup>44</sup>

The research tradition that I trace from Hughes has been subjected to an important critique by Marxist scholars of work, who have come to dominate sociology of work in 1970s (see Simpson 1989 and the discussion below). Similar critiques have been later applied to the more recent authors in this tradition (see Contu & Willmott 2003). I believe that the two traditions can be reconciled and that we must see work as being a matter of participating *simultaneously* in a cultural community and system of labor relations. Without attempting to work out such reconciliation fully in this chapter, I try to make explicit the disagreements between the traditions, setting up ground for a more balanced discussion in the later chapters.<sup>45</sup>

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43 Becker’s writing often shows a clear desire to avoid introduction of “technical” terms that would suggest an attempt at “Theory” with capital “T.” Becker thus often talks about “jobs”, “trades” or “occupations” but strives to use those as lay terms, without assigning to them any special meaning.

44 The GNU/Linux operating system (commonly known as just “Linux”), which today is used by a wide range of companies (from Google and IBM to Microsoft), as well as the US Army consists of two key layers of software. One of those layers—the Linux kernel—was allegedly written “just for fun” (the author’s own account was published under the title “Just for Fun”—Torvalds 2001). Another layer—the GNU system—came out of a determined and lengthy effort (1984 to the early 1990s, and continuing since) to provide the community of software enthusiasts with a freely available alternative to the proprietary UNIX operating system. Richard Stallman, the leader of the GNU project stresses that not all of that was fun, and that developing GNU was a matter a moral stand (see, for example, Williams 2002, Stallman 2002).

45 It should be clear that my own approach to the issue leans much more heavily on the Hughesian tradition than it does on the Marxist one. My goal, therefore, is not to merge the two approaches fully, but to bring certain elements of the Marxist critique into what overall is a Hughesian framework.

## Occupations as Named Parts in a System of Division of Labor

Everett Hughes, a transitional figure between the “first” and “second” Chicago schools of sociology, is often recognized as a founding figure in the modern sociology of work.<sup>46</sup> Hughes offers a theory of occupations that highlights the relationship between work and identity (at least for skilled work), looking at occupations as social groups, while at the same time considering their relationship with other occupations and their position in the societal division of labor. This second aspect of Hughes writing is often downplayed in the work of his followers, who often focus more fully on occupations as cultural groups, rather than units in the larger society. Revisiting the work of Hughes will help us establish a balance between “work as practice” and “work as labor” later in the chapter.

Hughes writes about “work” without defining this term but seemingly using it in a way that does not differ much from the vernacular usage. Unlike Marx, who sees “work” as a fundamental relationship between man and nature (see below), Hughes looks at work mostly in the context of contemporary industrial society. He associates “work” with participation in the “labor force” and “formally organized work activities... named and categorized in payrolls, organization charts and union-management contracts, and in income-tax, licensing, and social-security legislation” (1959/1994, p. 21-22).<sup>47</sup> He also contrasts “work” with “leisure” (p. 22-23). Hughes sees “work” as often defining the course of an individual’s life: “A man’s work is as good a clue as any to the course of his life, and to his social being and identity” (1958, p. 7). The type of work the individual does is the most important determinant of social status in the industrial society: “Race, sex, marital status, and other characteristics formerly determined civil estate quite directly; now it is work that counts... and the other characteristics take their importance by virtue of their influence on one’s place in the labor force” (1959/1994, p. 22).

Hughes focuses on skilled work, which he sees as divided into *occupations* (or more specifically *named occupations*). An occupation is defined simultaneously by a particular type of work activities, a group of people who carry them out, and their role in the division of labor. Hughes’s stress on the division of labor *between* occupations (drawing heavily on Durkheim’s notion of “organic solidarity”) is important to note here, since it is largely left out by much of the later “Chicago School” literature on work and practice. Specifically, Hughes writes that “an occupation, in essence, is not some particular set of activities; it is the part of an individual in any ongoing system of activities” (1959/1994, p. 24). He then re-defines an occupation as “a more-or-

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46 See Simpson (1989) and Ritzer’s (1989) response for an overview of the history of “sociology of work” in the 20<sup>th</sup> century. Ritzer in particular sees Hughes’s course on “Sociology of Work,” first taught in 1939 (p. 595) as establishing the field. As most reviews of the field’s history, Simpson and Ritzer both point to the work of Elton Mayo (e.g., 1933) as the precursor of the 1950s literature. (Burawoy’s 1979 review of “anthropology of industrial work” does this as well.) To save space, I start my review with Hughes.

47 Hughes’s notion of work appears to exclude unpaid work done by women, and housework in particular. The importance of such work has been since discussed by feminist scholars (e.g., Hochschild 1989). For the purposes of my argument it does not matter whether or not the concept of “work” includes unpaid work. Whether the work is recognized as “work” in the society is important, however. Invisible work of the kind described by Hochschild comes without a “calling card” (see Hughes’s quote below), which has implications for how it affects the identity of the people who do this work.

less standardized one-man's part in some operating system" concluding from this that an occupation "cannot be described apart from the whole" (p. 30). In introducing the notion of "*a more-or-less standardized one-man's part*" (my emphasis) in the larger division of labor, Hughes draws a link between the division of labor *between* individuals in a specific enterprise (as in Adam Smith's famous example of the pin factory), and the division of labor *between* occupations in the context of a larger industrial society. He suggests, in other words, that the division of labor between individuals is not organized on an ad hoc basis in every enterprise. Rather, the work tends to be divided in more or the same roles, which allows us to say that people who take the same role in different enterprises comprise the same "occupation."<sup>48</sup>

At the same time, Hughes stresses the personal significance and the cultural aspects of occupations. He sees many occupations as characterized by shared "culture" and "technique." Hughes ties the technique on the one hand to the culture shared by those who engage in the occupation, and to "a set of collective representations, more or less peculiar to the occupation and more or less incomprehensible to the community." He stresses that the practitioners of occupations have a distinct way of relating to certain objects and activities: "The technique of the physician is in relation to the human body, which must be for him a different sort of object from what it is for the layman. To the layman it is a sacred thing, and an object of sentiment." (1958, p. 35.) Members of the occupations see familiar objects in different ways. Even more importantly, they typically have a distinct way of seeing *the activity itself*.

Named occupations "are a combination of price tag and calling card" writes Hughes (1951/1958, p. 42). The "calling card" metaphor links two sides of the occupation: an occupation is a crucial source of individual identity, but it is important as a source of identity largely because it identifies the individuals' role in the industrial society. This metaphor and the term "*named occupations*" (my emphasis) bring together what I later (chapter 1.3) call the "external" and the "internal" view of "named" categories of practitioners.

## Insiders and Outsiders

Hughes's notions of "culture" and "technique" are closely tied to those of *membership* and *license*. "An occupation consists, in part, of a successful claim of some people to *license* to carry out certain activities which others may not, and to do so in exchange for money, goods and services," writes Hughes (1958, p. 78). The "license"<sup>49</sup> to perform certain activities is given to a *group*. The individual who seeks permission to engage in those activities must gain membership in the group that has the license: "the practitioners, by virtue of gaining admission to the charmed circle of colleagues... exercise the license to do things others do not do" (1958, p. 79). This leads to a question of how membership is granted—a question that Hughes, to the best of

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48 The relationship between occupations (or more narrowly "professions") is later developed further by Abbott (1988), who talks about "a system of profession."

49 Hughes uses the word *license* figuratively, except when talking about "professions," where members are literally licensed.

my knowledge, does not answer. The work of Hughes's student and co-author Howard Becker, however, helps shed light on this issue.

Howard Becker, one of the most well-known figures of "the Second Chicago School," started his career with a study of Chicago jazz musicians. His 1951 paper on the subject (Becker 1951) introduces the study as a case of conflicts experienced by "members of service occupations" (p. 136) and Hughes incorporates Becker's study as an example of an occupation (1951/1958, one of Hughes's early publications on the subject of occupations). However, Becker later reprints the study in *Outsiders: Studies in the Sociology of Deviance* (1963). This re-conceptualization of the practice of Chicago jazz musicians from "an occupation" to membership in "a deviant group" may seem puzzling, but in fact provides us with an opportunity to get a deeper understanding of Hughes' discussion of occupations as groups.

While viewing jazz musicians as first an occupation and then as a "deviant group" may seem strange, we should remember that one of the key aspects of an occupation for Hughes is that its practitioners *do things that other people do not do*. Becker's notion of "deviance" does not correspond precisely to Hughes's (and early Becker's) "occupation," but those two kinds of groups share enough similarities to warrant a comparison. Becker defines as "deviant" activities that are labeled as such by groups that do not engage in them.<sup>50</sup> He explains his inclusion of Chicago jazz musicians among "deviant groups" (in a chapter following one about marijuana users) by the fact that "their culture and the way of life are sufficiently bizarre and unconventional for them to be labeled as outsiders by more conventional members of the community" (1963, p. 79). Both types of groups are thus characterized by "a culture" and engage in activities that other people do not do. The question of whether the musicians form "an occupation" or a "deviant group" would thus presumably rest on whether they have a *license* to engage in the activities that they engage in. There is a marked difference, however, between Hughes and Becker as to *whose licenses is relevant*. Hughes talks abstractly about "the society" allowing people to do certain things. Becker is careful to be more specific. The jazz artists do not generally lack *society's license* to play: their activities are legal and they have audience that enjoys their music. Rather, they are labeled as outsiders by specific (if powerful) other groups.<sup>51</sup>

Becker's insight has important consequences for the discussion of occupation. Becker urges us to avoid looking at rule-breaking without asking who creates the rules and when they choose to enforce them. Deviance becomes a matter of group boundaries and their enforcement. Applied to studies of work this suggests that we might want to question Hughes distinction between activities for which society does or does not give license to certain groups (and more generally the idea of a monolithic "industrial society"), and instead look at people who engage in certain activities, form a group (recognized by themselves and often by outsiders) by virtue of such engagement, have a distinct "technique" for performing the activity, and a special way of relating to this activity and the relevant objects. Looking at it this way, we quickly realize

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50 This later became known as the "labeling theory" of deviance and crime. More specifically, Becker writes: "I mean, rather, that *social groups create deviance by making the rules whose infraction constitutes deviance*, and by applying those rules to particular people and labeling them as outsiders" (1963, p. 9, original emphasis).

51 Such commitment to being clear about who the actors are is something that Becker not only practices in his own writing but has also taught to others through his methods books, e.g. Becker (1986, 1998).

important similarities between Hughes's doctors and Becker's marijuana users.

Becker's study of deviant groups (1953, 1963) develops Hughes's notions of "culture" and "technique" and presents a model of the process by which a newcomer enters the group, presaging some of the ideas of Lave & Wenger (1991). Becker's theory of progressive engagement in the activity (read with the hindsight assisted by Lave & Wenger) can be summarized as follows. The novice starts off with a limited interest in the activity, perhaps seeing little point in it (or worse, seeing it negatively). If they were to try to engage in the activity by themselves anyway, they would likely fail to obtain the expected results, lacking the necessary *technique*. (A first-time user of marijuana will likely burn her throat by inhaling incorrectly. A wannabe programmer will likely write code that will not run.) If they do obtain the results, they might fail to recognize or appreciate them. (A novice marijuana user might fail to recognize being "high" and if she does might fail to find it enjoyable. A novice programmer might not recognize the joy of getting the code to compile.) Becker writes that the user must learn to *define* the effect of the activity as enjoyable, acquiring what Becker calls "a conception of the meaning of the behavior, and perceptions and judgments of objects and situations that make the activity possible and desirable" (p. 235). (I will further use the terms "perceptions and judgments" or simply "perceptions" as short-hand.) Experienced practitioners become important here, as they help the novice learn the basic technique and to develop the necessary "perceptions and judgments." This is not to suggest that they become the primary source of learning: rather they help the novice make early steps into the activity, and it is from the combination of their advice and own experience that the novice learns the perceptions and the technique.<sup>52</sup>

The shared techniques and dispositions are for Becker (1963) the *culture* of the group united by those activities.<sup>53</sup> While the novice acquires the culture of the group by engaging in the activity, this should not be understood as two distinct steps. As Becker shows, engagement in the activity is not a matter of a single decision, but is often a sequence of steps, each step leading the novice to changes in dispositions that make the next step sensible. Becker illustrates this best when he describes (Becker 1998) a deliberately extreme case of gradual changes that might lead a man to a sex change operation. Deepening engagement in the activity thus happens in lockstep with adoption of the culture of the group that practices that activity. We might add to this, that the entry into a subculture of the group defined by an activity may well precede direct contact with the actual activity.<sup>54</sup>

Becker (1963) sees this shared culture as arising from shared problems: "Many people

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52 This is quite similar to Vygotsky's "Zone of Proximal Development" (Vygotsky 1978).

53 Note that Becker includes "technique" in "culture" while Hughes talks about "culture and technique." Becker's inclusion of technique in "culture" (together with dispositions) makes sense, considering that he sees acquisition of technique as acquisition of proper dispositions.

54 For example, Desmond (2007, p. 69) writes about firefighters:

The process of becoming a firefighter begins long before young people join firecrews; it begins during their childhoods with thousands of experiences specific to their upbringing. In this way, firefighters acquire many of the skills and attitudes needed to chase smoke long before they step onto the fireline.

I discuss this process for software developers in chapter 2.1 ("Nerds").

have suggested that culture arises essentially in response to a problem faced by a group of people, insofar as they are able to interact and communicate with one another effectively” (p. 81). He notes, however, that not all activities develop a culture around them, since some activities are carried out in isolation, perhaps because they are stigmatized so much that those who engage in such activities choose to share this fact with nobody. (Becker uses the kleptomaniac as an example.) It is also clear that some activities, on the other hand, are so common that they do not lead to distinct group culture—instead the techniques and dispositions necessary for such activities are already present in the mainstream culture of the place.<sup>55</sup>

Becker’s theory, as summarized so far, illuminates the process by which the individual may come to engage in an activity, in a way that can be clearly applied to the process of entry into what Hughes would call occupations. It mostly leaves out, however, Hughes’s stress on the division of labor between occupations. It seems clear, that to understand the continuous use of marijuana in the United States or the continuous practice of jazz, software development, or medicine, we would need to not only look at how an individual comes to engage in those activities, but also at how such activities interact with other activities, considering, for example, the relations between users of marijuana and dealers or police. Becker raises this question in his first paper about the Chicago jazz musicians (1951), looking at their interactions with the clients, but limits his discussion to the musicians conflicted feelings about the clients.<sup>56</sup>

## Work as Labor

While most sociology of work in 1950s and 1960s shows influence of Hughes and other Chicago School authors, the field was transformed in 1970s under the influence of a different tradition: Marxism.<sup>57</sup> Although the Chicago School relied heavily on Durkheim (for instance, the ideas of “organic solidarity” and “industrial society”) and Weber, and while Durkheim and

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55 Becker (1963) talks about “the mainstream culture” generally, but it is important to keep in mind that there is no such thing as “the” mainstream culture. Understood as a shared set of techniques and dispositions, a culture is always linked with a group and is typically mutually constituting with it. (See the discussion of Van Maanen & Barley 1984, 1985 later in this chapter.) “Mainstream” is then always a relative term. One culture could be “mainstream” for another culture in the sense it the first culture corresponds to a group that forms a superset of the second culture’s group. (“The American culture” is mainstream in relation to the culture of American jazz musicians.) This becomes particularly important in later chapters, as we take an international perspective on practice and consider that occupational groups may span large areas and in this sense may be more “mainstream” than the local “mainstream” cultures from which they diverge. (For instance, the choice of English or Portuguese for software documentation can be described as “mainstream” depending on the frame of reference.) In this dissertation I use the word “mainstream culture” for cultures that dominate specific geographic places, cutting across occupations.

56 Becker later explores the division of labor between practices in *Art Worlds* (1982).

57 The transformation started in 1960s as many scholars started searching for the more formal alternatives to the ethnographic approach of the Chicago School, partly under the influence of Parson’s ascending structural-functionalism (see Simpson 1989, Ritzer 1989). Such search for formal and macro accounts may have paved the way for neo-Marxist approach to work. I do not discuss this decade to save space.

Weber had in turn been influenced by Marx (see Giddens 1971), Chicago School sociologists do not draw on Marx directly and their approaches differ from Marx's substantially, usually lacking interest in radical criticism, longer-term historical change and relationships of production. Marxist literature similarly developed up to 1970s independently of American sociology.<sup>58</sup> Braverman's (1974) *Labor and Monopoly Capital* (subtitled "The Degradation of Work in the Twentieth Century") and other Marxist writings of 1970s, however, had a great impact on American sociology of work.

Braverman, a Marxist coming from the socialist movement rather than academia, explicitly enters a debate with the literature on occupations, arguing that under capitalism work is increasingly deskilled and alienated. Alienation of labor in the capitalist society is one of core principles of Marx's thought, which Marx contrasts with what he sees as the natural (unalienated) labor. In Marx's writing, labor is understood as human efforts to transform their material environment to fit their needs for survival. Such efforts are defining of the human existence and serve as the foundation of any human society. In other words, no human society can be understood without paying attention to how it organizes efforts towards producing things that people need for survival. Unalienated labor involves collective effort to transform the material environment to serve the needs of the group. Under capitalism, however, the workers do not transform their material environment towards *their* needs. Instead, they offer their labor to the capitalist in exchange for money. Labor then becomes "alienated" (alternatively "estranged" or "externalized"<sup>59</sup>), that is external to the worker (Marx 1978, Giddens 1971, Braverman 1974). Marx then makes an additional argument that the division of labor inside a capitalist enterprise requires the workers to increasingly focus on small tasks, further alienating them from the product of labor. Further, mechanization makes those tasks increasingly simple, making the worker "a living appendage of the machine" (Marx 1867/1977, p. 614).

Braverman (1974) extends Marx's theory, arguing that since the capitalist purchases from the worker abstract labor rather than specific products of labor, organizing this labor in order to maximize productivity becomes the responsibility of the capitalist. (Such organizing is achieved through capitalist' agents: the management.) Since the workers have no intrinsic interest in the work, the capitalist cannot rely on the workers to apply their labor in the most productive ways. The capitalist's solution, according to Braverman, is to capture the knowledge that was once in possession of the practitioners of different crafts, and then prescribe to each worker exactly what to do. (Braverman thus relies on a theory of knowledge that is akin to "the codification view" described earlier, though he focuses on the disempowerment of the worker, rather than the empowerment of "the society." Braverman's acceptance of the positive but not the normative side of the codification view, points out the political assumptions—and class interests—inherent in the standard articulation of the codification view.)

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58 Indicative of this fact, Burawoy (1972) talks about "sociology" and "Marxism" as two distinct lines of thought. While he points out the influence of Marxism on sociology ("sociology has borrowed much from Marx and emerged in part through a debate with him," p. xiii), this influence is presented as a matter of one tradition influencing another. In contrast, today's canon—as taught in the United States—includes Marx as a *founder* of sociology, not an external figure who influenced it (see, for example, Giddens et al. 2007).

59 According to Giddens (1971), Marx uses two different German words interchangeably, both of which are traditionally translated as "alienation": *Entfremdung* ("estrangement") and *Entäusserung* ("externalization").

Such organization of “the labor process” completes alienation of labor, as it removes the need to rely on workers’ creativity, and allows the capitalist to simply buy workers’ time. This “degradation of labor” depresses wages, since any worker can in theory do any work. Additionally, Braverman argues, the worker’s “working time becomes sharply and antagonistically divided from nonworking time, and the worker places an extraordinary value upon this ‘free’ time, while on-the-job time is regarded as lost or wasted” (p. 278).

Braverman also attempts to update Marx by presenting an argument against “middle layers” of employment. Much of those workers have been absorbed into the labor market, he argues, and their work is also increasingly deskilled. While Braverman makes his argument most convincingly for clerical workers, he suggests that even “professionals” (Braverman uses this term in quotations) are not exempt from the alienating effects of capitalist labor process.<sup>60</sup> Braverman thus presents an image of work that stands in stark contrast with that painted by Hughes (1958). Hughes’s understanding of work is most certainly influenced primarily by his understanding of skilled work. While he considers briefly unskilled work (“jobs,” which require no more than “to present one’s self at the proper time and place when manpower of a certain age, sex, and perhaps a certain grade of intelligence, is wanted,” p. 34), he seems to treat such work as atypical of the modern society, focusing instead on work that does require skill (which he calls “professions,” “arts” or “trades”). Braverman, on the other hand, treats the professions as an exception, suggesting that for most workers work increasingly lacks any meaning.

Braverman’s book greatly influenced sociology of work (see Simpson 1989, Ritzer 1989), leading to a focus on deskilling and on the importance of differences among the different workers. Much of the ensuing discussion questioned Braverman’s argument.<sup>61</sup> Form (1987), for example, argues that Braverman overestimates the importance of skilled work in the 19<sup>th</sup> century and that Taylorism had less effect on work than Braverman assumes and was only implemented in industries that already relied primarily on unskilled labor.<sup>62</sup> After considering the difficulties involved in measuring or even defining “skill,” Form concludes that there is no support for deskilling across the board, and that the effects of technology and mechanization vary greatly by industry. The argument about deskilling continues until today, without any unambiguous conclusions, but with overall stronger support for upskilling than for deskilling. Perhaps the most important lesson that we learn from this literature is that there are very different kinds of work.

Some authors have used this diversity of skills to argue for the emergence of a “dual labor force” (see Simpson 1989 for a review), divided into skilled and privileged “core” (or “primary”) labor force and deskilled “peripheral” labor force. This argument is later restated by Castells

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60 For example, he writes: “By the end of the 1960s, however, the rising rates of unemployment among ‘professionals’ of various kinds once more brought home to them that they were not free agents they thought they were, who deigned to ‘associate themselves’ with one or another corporation, but truly part of a labor market, hired and fired like those beneath them” (p. 408).

61 Form (1987) argues that some of this discussion predates Braverman’s book (1974), and Braverman himself reviews some of the literature. However, there is little question that Braverman’s book brought this discussion to the front of the stage.

62 In other words, Form argues that Taylorism has been applied successfully to make unskilled workers work harder, but has not been useful for reducing the need for skill.

(1996/2000), who identifies the core labor force with “information-based managers” (p. 295). As the rest of this dissertation suggests, the boundaries between the two cannot always be drawn clearly.

Braverman’s (1974) argument assumes, following Marx, that workers engaged in repetitive manual labor cannot find meaning in such work. Some of the other Marxist authors have disagreed with this. Burawoy (1972) presents an interesting fusion of Marxism and non-Marxist sociology:<sup>63</sup> drawing on his ethnography at a plant he argues that workers *do* identify with their work and put substantial effort into it because they redefine it as a game. In other words, while Burawoy accepts the Marxist premise that hard work in the factory goes against the workers’ class interests, he draws a distinction between the objective meaninglessness of work (as seen by the social theorist) and the workers’ subjective experience of this work.

Willis’s (1977) *Learning to Labor* presents a similar argument, with even more powerful ethnographic evidence. Willis looks at how working class culture is reproduced in British schools, pointing out how the students’ counter-school culture prepares them for acceptance of manual work. Willis’s “lads” see themselves in opposition to “ear’oles”—the students who buy into the school’s agenda (and presumably later move on to clerical work). They see manual work as masculine, “rough” work that not everybody could do.<sup>64</sup> They also see manual work as allowing them freedom of mind: requiring them to perform certain activities but allowing them to see those activities as they like.<sup>65</sup>

This dissertation draws on ethnography of software developers—people typically classified as “professionals.” The image of work that it paints is clearly more similar to that drawn by Hughes and even Becker than to the one presented by Braverman (1974). I do not accept Braverman’s argument that professionals represent a disappearing breed and that technical expertise is concentrated in just about 3% of the labor force.<sup>66</sup> (Though, they clearly do not

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63 Burawoy (1972) does not identify the non-marxist side of his analysis with Hughes explicitly (whom he cites only parenthetically). However, that side of his theory aligns well with what I consider a Hughesian tradition.

64 See Lamont’s (2000) *The Dignity of Working Men* for a more recent discussion of the way blue-color workers perceive their work.

65 Willis argues that middle class professionals “are being paid for what they *are*” (p. 131, original emphasis), while the *weekly* wages of the factory workers symbolizes the recognizes the selling of labor power. This arrangement, in certain sense leaves manual workers free to *be* what they want to be. At the same time, Willis’s ethnography shows clearly the ways in which the occupation is intertwined with who the workers think they are.

66 Braverman (1974) writes:

[W]hat is remarkable is the concentration of the technical expertise of United States industries in a relatively small grouping. Taken together, the technical engineers, chemists, scientists, architects, draftsmen, designers, and technicians represented not much more than 3 percent of the population in 1970s. (p. 241.)

Considering that Castells puts the number of professionals and technicians at 14.2% of the labor force for 1970 (vs. 16.9% in 1991, Castells 1996/2000, citing US Labor Statistics), Braverman either is wrong about the numbers or is willing to grant monopoly on technical knowledge to just a small fraction of professionals and technicians. A number of scholars (Orr 1996, Barley & Bechky 1994) have since argued that technicians work

represent the typical case, as one might infer from Hughes's writing.) At the same time, I take from Braverman the key insight that even skilled work must be understood as a form of labor. To be more precise, I believe that it must be understood as often being a matter of both practice *and* labor.

The Marxist critique presented a challenge of reconciling the cultural understanding of work with the realities of work as a "labor process." This reconciliation is partly provided by Van Maanen & Barley (1984). Speaking primarily to the organizational studies audience, Van Maanen & Barley argue for looking at workers as embedded in "occupational communities." They define an occupational community as:

a group of people who consider themselves to be engaged in the same sort of work; whose identity is drawn from the work; who share with one another a set of values, norms and perspectives that apply to but extend beyond work related matters; and whose social relationships meld work and leisure.

Like Hughes, they stress the fact that work is often carried out in bounded occupational groups, the members of which share culture and identity. Their paper elaborates this aspect of Hughes's approach, mostly leaving aside (as does early Becker) the question of division of labor between the occupational groups.

Van Maanen & Barley (1984) for the most part do not engage in an explicit debate with the Marxist literature.<sup>67</sup> At the same time, they present an image of work that is largely aligned with that of Hughes and Becker, but reinforced against some of Marxist critique by explicit discussion of the organization. They also apply the concept of "occupational communities" to a many different types of work, including work that is typically classified as "unskilled" (e.g., janitors or the street sweepers of Benares)—thus going explicitly against Braverman's claims.

Van Maanen & Barley's analysis incorporates the idea that members of an occupational community stand in a particular relationship with organizations that employ them, essentially recognizing that this relationship involves in part the sale of labor (though they do not use this term). To some extent (and only while employing a micro-sociological perspective), we can see parallels between what Braverman (1974) calls "the capitalist" and "the capitalist enterprise" and what Van Maanen & Barley (1984) call "the organization." However, while Braverman would see the enterprise and the workers as being fundamentally in conflict, Van Maanen & Barley stress the complexity of this relationship. They see individual workers as participating simultaneously in two groups: the occupational community and the organization. They see this dual membership as often being a source of conflicts, which arise from the misalignment between the interests of

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involve more knowledge than is commonly assumed.

67 They do briefly argue against Braverman's notion of deskilling in a different article (Van Maanen & Barley 1985), using Barley's study of CT scan technicians as a case of upgrading of skills, though they attack specifically the idea that *all* types of work become deskilled due to technology. Introduction of CT scans, they write, allowed some of the former X-ray technicians to become "CT techs" and engage in work that required new skills and gave them more autonomy and responsibility. They argue that "while a radiologist or a referring physician would never ask an X-ray technologist to read a film, such requests are routinely made of sonographers and CT techs" (p. 44).

the workers as members of the occupation and the organization. At the same time, they recognize that goals of the two may align to a substantial extent and that for many occupations the organization is a necessary evil, without which the occupational tasks cannot be practiced: “certain kinds of engineers often discover that their collective aims and identities can be satisfied only within large, heteronomous organizations where sufficient resources to pursue occupationally-valued ends are to be found” (p. 310).<sup>68</sup>

Van Maanen & Barley draw on a theory of motivation that is rarely employed in Marxist thought. Like many other Marxists, Braverman (1974) seems to recognize two theories of motivation: people may engage in work for the sake of the products that their work creates, which they then use individually or collectively *or* they may sell their labor for money, which is then used to obtain products. Both theories are fundamentally *economic*. Van Maanen & Barley, on the other hand, recognize, following Hughes, Becker and others, an entirely different source of motivation. To quote Becker (1953) again, “the motivation or disposition to engage in the activity is built in the course of learning to engage in it and does not antedate this learning process” (p. 235). Engaging in work activities then cannot be understood without considering how workers see their work, and their perception of work cannot be reduced to economic interests, as sociologically-minded Marxists have come to recognize (Burawoy 1972, Willis 1977).<sup>69</sup>

## Boundaries

Van Maanen & Barley (1984) stress the importance of boundaries, which they define phenomenologically: “the first attribute of an occupational community is that it is composed of people who consider themselves ‘to be’ members of the same occupation rather than ‘are’ members of the same occupation” (p. 295). This focus on member-defined boundaries leads them to say that the relevant groups are often smaller than we might think at first:

Conventional labels typically represent the theoretical limit of an occupational community. Within this boundary, socially significant types... are sure to exist. [...]

Commercial fishing provides a useful example because within its boundaries

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68 For a flip side of this relationship, see Kunda’s (1992) *Engineering Culture: Control and Commitment in a High-Tech Corporation*.

69 Van Maanen & Barley also elaborate substantially the concept of “culture,” a secondary concept for Hughes which they make central to their discussion. Like Becker, they see culture as a set of solutions developed by people who face shared problems (1985, p. 33), when such people form a group by virtue of “differential interaction” (1985, p. 34). The culture necessarily involves “collective understandings,” which in turn comprise “social world” (1985, p. 34). Understood this way, the culture is not just an attribute of a group: “Culture is not something a group possesses more or less of at any given time; it is something it is” (1984, p. 307). Following Goodenough, Van Maanen & Barley understand culture as “the things a person must know to be a member of a given group” (Goodenough, quoted in Van Maanen & Barley 1984, p. 308). Finally, they argue that cultures do not exist apart from the people who carry them and “endure only to the degree that their content is transmitted from one generation to the next” (p. 35), and are subject to negotiation between interacting individuals. Unfortunately, this latter aspect is not developed further.

are found several rather distinct occupational communities. “Traditional fishermen” recognize differences between themselves and “nontraditional fishermen” such as “educated fishermen,” “part-timers,” and “outlaw fishermen” [...]. Even more important are the distinction made within types. Thus, in the port of Gloucester, Massachusetts, traditional fishermen divide themselves into two groups, Guineas and Greasers. (p. 296)

Van Maanen & Barley’s stress on the boundaries recognized by the members as defining the occupational communities, however, creates a problem, if we try to use the concept of “occupational communities” as an elaboration of Hughes’s “occupational groups.” A crucial feature of Hughes’s occupational groups is that members of a group get *license* to perform certain tasks by virtue of their membership. Since Hughes sees this license as something recognized by outsiders, the boundaries of the group as perceived by *outsiders* cannot be ignored. To practice medicine, one must be recognized as a doctor not only by colleagues *but also by patients, nurses and pharmacists*. While recognition by fellow members may often be a prerequisite to being recognized by outsiders, it is the recognition by outsiders that ultimately allows the member to take part in Hughes’s division of labor, engaging in tasks that have been allocated for the members of his occupation. We thus need a better theory of boundaries and legitimacy.

We can find such a theory in the Science and Technology Studies (or STS) literature, which comprises another tradition that is closely related to the discussion of occupation (and especially technologically-intensive occupations). This tradition becomes prominent in 1980s, and later discussion of technical work is impossible without considering it at least briefly. The origin of STS can be found in two disciplines: philosophy of science and sociology. Philosophy of science provides the question around which most early STS work has revolved and the shadow of which can be seen in much of the later STS literature: what distinguishes science from pseudoscience. This is often known as “the demarcation problem” (see Gieryn 1983 for history of the concept.) Philosophy of science has typically attempted to provide a normative answer to this question: a method that could be used to distinguish science and pseudoscience. Popper’s (1959) suggestion that scientific claims must be “falsifiable” is an example of this approach.<sup>70</sup> Kuhn (1962), however, critiqued Popper, drawing on detailed accounts of how science was actually done. By presenting a *social* critique of what up to then was a philosophical discussion, Kuhn opened the door to sociological investigation of demarcation practices, which focused on how demarcation decisions *are made*, drawing heavily on the notion of “social construction,” originally introduced by Berger & Luckmann (1966).<sup>71</sup> Latour & Woolgar’s (1979) *Laboratory Life*, perhaps the most influential book in this tradition written in 1970s, provided a detailed

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70 See Lakatos (1970) for an elaborated version of Popper’s argument and a defense against some of the criticism.

71 See, for example, Turner (2008), who also provides an account of social study of science before Kuhn. Turner argues that most of the earlier social studies of science followed an “extensive” view of science, aiming to extend the scientific methods to other areas of social life. While Turner points out that Weber’s discussion of science contains certain elements of the later critique, such discussion is hardly systematic. The research on science conducted in 1960s and 1970s by Merton similarly argues for autonomy of science (Turner, p. 49). Turner notes, on the other hand, the influence of Michael Polanyi’s and J. B. Conant’s views on Kuhn.

analysis of how scientific facts are “created” in the lab.

The STS literature differs substantially from studies of work conducted in science or engineering labs (such as, for example, Barley & Bechky 1994) in that STS is typically interested first and foremost in the *science* (or the technology), subjecting the work of scientists and engineers to careful study in order to achieve a better understanding of the *result* of their work. Work studies, on the other hand, often take work itself as the primary object of investigation. Consequently, studies of work applied to scientific and engineering occupations typically compare such work (at least implicitly) with other types of work. Despite those differences, the two traditions have often looked at the same types of work and some of the STS methods are quite relevant to understanding work broadly.

STS has traditionally taken a critical approach to the people it studies: rather than practicing Weberian “sociology of understanding” towards scientists and technologists, STS has typically aimed to undermine their accounts of how science and technology are done.<sup>72</sup> Such critical approach is a double-edged sword. On the one hand, STS literature teaches us how to cut through members’ ideology, especially in the difficult cases where the subject matter of their work is sufficiently complex that the researcher cannot fully understand it, and when some of the subjects may be of higher social status than the researcher, be generally seen as more knowledgeable and better qualified to speak for the rest of the members. I employ some of those tools in this dissertation, in particular when trying to look beyond the idea of software development as a “global” profession.<sup>73</sup> At the same time, such critical attitude can incidentally cut off too much of the members’ experience, leaving us with overly rationalized and economic explanations of their actions (see for example Latour & Woolgar 1979, Latour 1988a).<sup>74</sup>

Gieryn’s (1983) notion of “boundary-work” is particularly valuable to understanding practice.<sup>75</sup> Gieryn looks at the problem of demarcation as a practical problem for scientists. He writes:

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72 Needless to say, ethnographers must always take critically what their subjects tell them. They rarely start their work, however, with the goal of undermining the accounts constructed by their subjects. I also recognize that some STS scholars present compelling accounts of how scientists experience science—for example, Latour 1979 looks at scientists’ careers and tries to show to the reader the world through their eyes. Such accounts, however, typically come across as unsympathetic. (Traweek, 1988, presents an particularly complicated case for this generalization. However, the book is arguably not written fully in the STS tradition, but instead may be best understood as a cultural-anthropological study of a western scientific community—something rarely done before that—linked to the STS literature only in the later phase.)

73 Traweek’s (1988) analysis of “culture of no culture” among the physicists provides a direct inspiration. Traweek’s discussion of “culture” reminds us that culture can be not only empowering, but also oppressive.

74 It is sometimes said that the critical approach is justified because unlike factory workers, scientists and engineers have had the opportunity to speak for themselves and have made their position known; the researchers job is then to debunk their stories. This explanation conflates, however, the members’ experience of their work with those accounts of the work directed to outsiders that are sanctioned by the community. Between such official accounts and economic rationalization of researcher’s observations, STS often misses the actual meaning that individuals attribute to their work.

75 Abbott (1988) expresses a number of similar ideas, though I find the concept of “boundary-work” more useful for micro analysis than those used by Abbott.

Construction of a boundary between science and varieties of non-science is useful for scientists' pursuit of professional goals: acquisition of intellectual authority and career opportunities; denial of these resources to "pseudoscientists"; and protection of the autonomy of scientific research from political interference. (p. 781.)

He then introduces the notion of "boundary-work" as "an ideological style found in scientists' attempts to create a public image for science by contrasting it favorably to non-scientific intellectual or technical activities" (p. 781) and "their attribution of selected characteristics to the institution of science (i.e., to its practitioners, methods, stock of knowledge, values and work organization) for purposes of constructing a social boundary that distinguishes some intellectual activities as "non-science" (p. 782). While Gieryn looks at specific rhetorical tools employed by scientists in their "boundary-work," the term has gained a broader circulation, denoting more generally the active (and often purposeful) construction of boundaries between groups. The term has obvious application to the discussion of occupational cultures: while Van Maanen & Barley (1984) stress Weberian "consciousness of difference," the concept of boundary-work suggests that such differences are not something that the members are merely conscious of, but are something they actively construct.<sup>76</sup>

Finally, some of the research in STS has addressed directly the issue of space. I leave this discussion for later, however, when discussing Latour in chapter 1.3.

## Practice, Power and Peripherality

Lave & Wenger's (1991) *Situated Learning* is written in a somewhat different tradition from Hughes, Becker or Van Maanen & Barley, but has since been incorporated into the work studies canon and is often read through its prism. Like Becker (whose 1972 article on schools Lave & Wenger cite), Lave & Wenger look at a broader category than "work" or "occupation." The book looks at learning, re-conceptualized as progressive engagement with "communities of practitioners" or "communities of practice," which they define as follows:

A community of practice is a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice. A community of practice is an intrinsic condition for the existence of knowledge, not least because it provides the interpretive support necessary for making sense of its heritage. Thus, participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. (p. 98)

The concept of "a community of practice" shares important characteristics with Becker's

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76 The discussion of boundaries of course precedes Gieryn's work. Lamont & Molnár (2002) provide a useful review of the way the concept of "boundaries" has been used in sociological literature, looking both at the historical use of the concept as well as the more recent developments in the literature.

“groups” and Van Maanen & Barley’s “occupational communities.” It similarly involves a notion of a bounded group that carries out certain activities, made possible by the groups’ “knowledge” (Hughes’s and Becker’s “technique”) and a shared interpretive system (Hughes’s “culture,” Becker’s “perceptions and judgments,” Van Maanen & Barley’s “culture” understood as “a meaning system.”). Like Hughes, Lave & Wenger explicitly define communities of practice “in relation with other tangential and overlapping communities of practice,” though they do not explore this aspect of communities of practice in any substantial depth.

The concept of practice provides a useful alternative to the notions of “work” and “occupation.” It first of all gives us a *broader* term, helping us see similarities between organized activities that we consider “occupations” and those that we do not. (Lave & Wenger’s examples of practice include “Alcoholics Anonymous,” which is clearly not an occupation in Hughes’s sense, but likely an “activity” and perhaps a “deviant group” in Becker’s terms.) While a similar shift is made by Becker, it is obscured by the focus on deviance. Lave & Wenger’s notion of However, “practice” is not merely a generalization of an “occupation,” but a multi-faceted concept with its own theoretical history. It would therefore help to pause to analyze it briefly.

Oxford English Dictionary breaks the usage of the English word “practice” into four semantic subfields (after omitting obsolete and rare senses):

- (1) exercise of a profession (“began his law practice”),
- (2) actual application of an idea (“integrates theory with practice”),
- (3) customary or established conduct (“has become common practice”),
- (4) repetition for the sake of improvement (“hours of daily severe practice”).<sup>77</sup>

When used in social science, the term “practice” typically takes one of the first three meanings, which for the sake of simplification can be reduced to two dimensions:

- A. a system of procedures established within some group (most of 1 and 3 above)

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77 After removing examples, and obsolete or rare meanings, the four subfields are:

1. The carrying out or exercise of a profession, esp. that of medicine or law. Also as a count noun: the business or premises of a doctor or lawyer.
2. a. The actual application or use of an idea, belief, or method, as opposed to the theory or principles of it; performance, execution, achievement; working, operation; (Philos.) activity or action considered as being the realization of or in contrast to theory (cf. PRAXIS n. 1a). [...]  
d. In Marxist and neo-Marxist thought: the political and social action which should result from and complement the theory of Communism. Cf. PRAXIS n. 1b.
3. a. The habitual doing or carrying on of something; usual, customary, or constant action or performance; conduct.  
b. A habitual action or pattern of behaviour; an established procedure or system. Usu. with negative connotations in early use. [...]  
c. Law. An established legal procedure, esp. that of a court of law; the law and custom on which such procedure is based; [...]
4. Repeated exercise in or performance of an activity so as to acquire, improve, or maintain proficiency in it; activity undertaken to this end; [...]

B. action contrasted with theory (subfield 2).<sup>78</sup>

Those two dimensions are related, but are at the same time distinct, with different history in social science, though sometimes used by the same authors. Lave & Wenger (1991), in particular, invoke *both* dimensions and it is important to understand how they combine them.

A. “Practice” understood as a coherent set (or a system) of activities in which some group of people engages fits quite naturally with the cultural theory of occupation discussed so far. It corresponds quite well to Becker’s “activity” and can be seen as a superset of Hughes’s and Van Maanen & Barley’s “occupation.”<sup>79</sup> Specific practices in this sense are defined by *differences and boundaries*. A “practice” is always implicitly contrasted with some other way of doing things (or simply *not* doing something). Additionally, within the tradition reviewed so far (and also for Lave & Wenger), a practice is always linked (and mutually constitutive) with a group. When people who engage in a practice are in contact with those who do not, engagement in the practice marks social boundaries and serves as a source of identity for the practitioners. Lave & Wenger invoke this sense of practice when they talk of practices as having histories and involving sets of relationships, and also when they use “communities of practitioners” as an alternative to “communities of practice.”

B. “Practice” understood as a form of engagement with the world that aims to transform rather than merely understand it, has no explicit parallel in the work of any of the authors discussed in earlier sections, but is common in Marxian thought.<sup>80</sup> Lave & Wenger (1991) invoke this sense of practice explicitly, and more generally as they argue for the primacy of action over theoretical knowledge. Communities of practice are communities of *action* rather than theory, defined by what people do rather than by what they know abstractly.<sup>81</sup> The distinction between practice and theory becomes particularly important with the rise of “informational” understanding of work.

Lave & Wenger’s (1991) discussion of practice uses the second dimension to explain the first: a practice, understood as a system of activities, persists in time because new people come to engage in it, and this entry must be understood as a matter of joining the actual activities, rather

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78 Most of the examples that OED assigns to field 1 would fit in field 3, and others would fit in 2. The differences between fields 1 and 3 appear to have much to do with a focus on boundaries vs. custom. My dimension A corresponds closely to the second of the three “notions of practice” identified by Schatzki (1996): “the temporary unfolding and spatially dispersed nexus of doings and sayings” (p. 89). My dimension B corresponds (though less obviously) to Schatzki’s third notion: “performing an action or carrying out a practice of the second sort” (p. 90). Schatzki’s first notion (“learning how or improving one’s ability to do something by repeatedly working at and carrying it out,” p. 89) corresponds to the semantic field 4, which I discard in my analysis. (Schatzki similarly dismisses this first notion as irrelevant to his analysis.)

79 We could say that a “practice” is a type of “activity” and an “occupation” is a type of “practice.” Use of marijuana is an “activity”, and perhaps a “practice” but not an “occupation.”

80 Marx’s notion of practice (or “praxis”) can itself be further broken down into two: (B1) the idea of practice as a transformative engagement with the world and (B2) the question of the relationship between practice and theory. See Rasmussen (1979) for a discussion of the relation between the two and their relation to the Aristotelian origin of the concept of “praxis.” Lave & Wenger incorporate both sides of this second dimension.

81 Of course, developing theory is itself a form of practice.

than absorption of the abstract knowledge that may be said to underlie the practice.<sup>82</sup> Reliance on this second dimension of “practice” leads Lave & Wenger (1991) to look at how the practice relates to the material world and how a novice comes to engage in the activities that comprise it.

The attention to the material aspects of the practice highlights the importance of tools. The activities carried out by the practitioners, typically involve transformation of certain objects.<sup>83</sup> (Sometimes the objects are just the members themselves, as is the case of the Alcoholics Anonymous example, but this is the exception.) This transformation is made possible by interpreting the objects in a particular way, but it often also relies on artifacts, which “carry a substantial portion of that practice’s history” (p. 101). In many cases it is the access to such artifacts that limits entry for new members.<sup>84</sup> On the other hand, since material tools are mobile in different ways than persons or culture, they may be important when we later discuss reproduction across space, as we will see later.<sup>85</sup>

To understand how a novice comes to partake in the activities, Lave & Wenger (1991) also introduce the theory of “legitimate peripheral participation,” arguing that new members enter the practice by engaging in peripheral tasks, and moving to other tasks gradually. Such peripheral participation allows them to become *members* (at least tentatively) and to start absorbing the knowledge and culture without having the expertise that is expected of the full members and necessary for engagement in the more central tasks. The notion of legitimate peripheral participation is in some ways similar to Becker’s theory of social learning (1953), but it adds a crucial component of *legitimacy*. Since practice often requires a “license” (from other practitioners, the larger society or both), we must pay attention to how the novice obtains the initial permission to enter. When looking at the role of the university programs that train software developers, we must consider not only what the future software developers might learn there, but also the way in which such practices may allow the students to become legitimate participants in certain practices.

The notion of legitimacy links the discussion of practice to the notions of *power* and *access*. Power relationships within the community as well as those of the larger society grant access to some participants and deny it to others. “Hegemony over resources for learning and

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82 Bourdieu’s work (1977), referenced by Lave & Wenger, similarly bridges the two senses: Bourdieu’s “*pratique*” opposes creative practical activity to generative structures, but is closely related to his concept of “*habitus*”—a system of dispositions that distinguishes one group of people from another.

83 The focus on objects and tools is also shared by scholars working in the Activity Theory tradition (e.g., Vygotsky 1930/2002, Leontiev 1972/1981, Engeström 2001). Lave & Wenger (1991) draw on Vygotsky, and the two approaches have much in common.

84 In some cases, lack of access to the material tools leads to a creation of a parallel practice, which aims to replicate the original practice without the missing tools. For example, a world-wide flight simulator community aims to replicate in minute details some aspects of the pilot’s practice using flight simulator software to compensate for lack of access to real airplanes. (To do this they work together with people who simulate the practice of air traffic controllers.)

85 A similar idea is expressed by Bruno Latour (1988a) who writes about the importance of “immutable combinable mobiles” for reproduction of technoscience. This idea is discussed in chapter 1.3. More generally, Latour’s stress on inclusion of “non-human actors” in analysis fits with the Lave & Wenger’s (1991) stress on materiality and tools.

alienation from full participation are inherent in the shaping of the legitimacy and peripherality of participation in its historic realizations,” write Lave & Wenger (p. 42). Furthermore, those who are admitted do not necessarily become equal to the old-timers upon this admission. Legitimate peripheral participation therefore “can be a source of power or powerlessness” (p. 36). In particular, “as a place in which one is kept from participating more fully—often legitimately, from the broader perspective of the society at large—it [peripherality] is a disempowering position” (p. 36).

The theory of legitimacy, access and power, however, is underdeveloped in Lave & Wenger, and is critiqued by Contu & Willmott (2003, 2006), who label Lave & Wenger’s theory of power “embryonic” and hold Lave & Wenger in part responsible for the later “conservative” misreading of their book. In particular, Contu & Willmott (2003) argue that Lave & Wenger often seem to take for granted the cohesiveness of communities:

*In Situated Learning* and its subsequent refinement (Wenger 1998), the concept of community is ostensibly positioned on a conflictual terrain (Wenger 1998, Ch. 2). However, the condition of existence of such communities is located in harmonizing categories such as “a sense of joint enterprise relationship of mutuality shared repertoire of communal resources” (Wenger 1998, emphasis added). Community is conceptualized in a way that tends to assume, or imply, coherence and consensus in its practices. Such “unequal relations of power” (Lave and Wenger 1991), we suggest, glosses over a fractured, dynamic process (p. 42) of formation and reproduction in which schisms and precarious alignments that are held together and papered over by unreflexive invocations of hegemonic notions including “community,” “family,” “team,” and “partnership.” By default, Lave and Wenger’s usage of “community” is complicit in the reproduction and legitimation of this hegemonic process. (p. 287.)

Contu & Willmott underscore “the danger of assuming consensus in communities of practice,” and urge their readers to focus their attention on the idea of “practice” rather than “community.”<sup>86</sup> In my analysis of my fieldwork I specifically attempt to avoid this alleged shortcoming of Lave & Wenger, avoiding the term “community” except as a “native” term used by the participant, and treating it with caution then. Instead of assuming that software developers join a “global community” of software developers (as they often do describe it), I see them as engaging in a practice that requires negotiation of many power relationships. “Boundary-work” and other notions from STS (see above) become useful in uncovering the “construction” of the community.

Lave & Wenger (1991) use “legitimate peripheral participation” as a micro-sociological concept: something that applies to the activities and position of concrete individual people. However, this notion can also become useful at a higher level of analysis, when considering the position of certain groups within the larger world of practitioners. We can draw certain parallels between the role of an individual “newbie” software developer who have just started working at a

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86 See also Duguid (2005) for the discussion of “community” vs. “practice” in “communities of practice,” including the suggestion that the wide appeal of Lave & Wenger (1991) “owes a good deal to the seductive character of *community*, aptly described as a ‘warmly persuasive word’” (p. 109).

software company and the collective position of Brazilian software developers who have achieved legitimate but *peripheral* role in the larger world of software, and whose progression to more central participation involves substantial difficulties. Such position can similarly be “a source of power or powerlessness” (see Lave & Wenger 1991, p. 36). Such macro notion of peripherality has been expressed in some of the political economy literature (e.g. Evans (1979)). I discuss such links in chapter 1.3.

## Work as Situated Practice

Julian Orr’s ethnography of Xerox technicians (1996) is perhaps the best known of the books answering Van Maanen & Barley’s (1984) call for ethnographic studies of occupational communities. At the same time, the book “puts the flesh of everyday life on Lave & Wenger’s (1991) idea of a community of practice” (Barley, 1996, p. xiii). Orr’s focus on “work as doing, as practice” (p. 10) is indicative of this fusion—and the source of the title of this chapter. (Note, though, that Orr appears to focus mostly on practice in its “common sense” meaning, as defined above, without indexing Marxian praxis.) It is important to note that this fusion is not undertaken by Orr (1996) explicitly. In fact, as Duguid (2008) points out, Orr’s book “studiously avoids” any mention of Lave & Wenger. The first publication that uses Orr’s ethnography to illustrate concepts from Lave & Wenger is Brown & Duguid (1991).<sup>87</sup> This union is later blessed by Barley (1996) in his foreword to Orr’s book.

Orr’s ethnography follows a small “community of practitioners” that he calls “the reps” —Xerox field technicians, who attend to photo copiers installed on client’s premises—and looks at their relationship to a specific organization and the organization’s clients. The book provides a rich account of work that helped not only illustrate some of the ideas discussed above (especially those of Van Maanen & Barley 1984 and Lave & Wenger 1991 —see Brown & Duguid 1991), but also allowed for a *critique* of such ideas. For example, Contu & Willmott (2003, 2006) provide their own interpretation of Orr’s observation, accusing Orr himself and also Brown & Duguid (1991) of accepting the management point of view. While I agree with Contu & Willmott’s call for a more critical analysis of Lave & Wenger (1991) and Orr (1996), I see this re-interpretation as first of all a sign of the richness of Orr’s ethnography and aim for similar richness in my own examples.

While greatly admiring Orr’s ethnography, I also see danger in its richness. As Barley (1996) and Barley & Kunda (2001) argue, social science of work often relies on the available “images of work,” often outdated. Orr’s ethnography provided an image of work that helped replace the earlier images. The book greatly affected (both directly and through Brown & Duguid

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87 Since Orr’s book (1996) was not yet published at the time, Brown & Duguid (1991) rely on Orr’s earlier work, including his dissertation (Orr 1990). Brown & Duguid’s paper presents provocative ideas that go far beyond just using Orr’s work to illustrate the notion of “communities of practice,” but I do not discuss those other ideas here, as they speak primarily to organizational studies concerns and lie outside the main axis of my dissertation.

1991) the discussion of work in the years that followed its publication.<sup>88</sup> Such a discussion has consequently ignored some of the issues not captured by Orr's image. It had a particularly strong effect on the way Lave & Wenger's "communities of practice" are understood.<sup>89</sup> Even the literature that extended the term "communities of practice" to virtual communities bears the mark of Orr's image, often talking about such virtual communities as tight-knit and inward-looking.

Orr's ethnography, however, is based in a particular and highly peculiar place, Silicon Valley. Even on a clear day, such as the one that Orr describes in his first vignette (p. 15), someone driving through the valley sees a world with remarkably narrow horizons, bounded by hills on both sides. (It is a *valley*, after all.) Orr's writing captures the imagery of that small world in great detail, but largely ignores anything that happens beyond the hills that bound it. The reps' world appears to be fully contained within this narrow space. (The corporate headquarters of Xerox happen to be on the other side of the country, but this fact is hardly apparent in Orr's book—and is perhaps simply not relevant. Orr mentions the fact that "San Francisco" service area stretches as far as Guam, but does not describe any practical consequences of this.)

Geography does come up in one small passage, which gives us a glimpse of what Orr might have observed had he chosen a different place:

Frank began working with the corporation in Indiana, which may account for this reference to a Chicago Fix. Some districts get new machines before others, and some have accounts that will use the machines much more intensely than others. These districts encounter most of the problems before others will and must develop their own ways to fix problems until engineering and manufacturing catch up. Word of these innovations will spread, usually carrying acknowledgment of their origin. Such districts have a reputation among the surrounding districts as something like the big time, the cutting edge of the blunt instrument that is field service. Silicon Valley is such a district on the West Coast, Chicago is the same for the Midwest, and this may remind us that although service is intensely local, they do work as members of a multinational corporation, and what happens elsewhere in the corporate geography may matter to them too. (pp. 60–61.)

In other words, reps working in places such as Indiana do have to pay attention to practice occurring elsewhere—for instance in Chicago. Those working in Chicago or the Silicon Valley, on the other hand, must rarely be reminded about the rest of the world. What happens elsewhere, *may* matter to them, but does not warrant a discussion beyond this one passage.

I aim to present a different image of work: one that follows Orr in attempting to show the importance of local work, yet also captures how, for many people, what happens elsewhere has

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88 See, for example, the 2006 special issue of *Organizational Studies* dedicated to the tenth anniversary of Orr's book for the discussion of the influence that the book has had.

89 See Duguid (2008) for a discussion of what was gained and lost by making Orr's "reps" the standard example of a community of practice.

tremendous importance on a day to day basis, and where “elsewhere” refers to places that are much further from them than Frank’s office was from Chicago. Such an image will help us extend the insights of Lave & Wenger (1991) to the new, globalized work.

Both Lave & Wenger (1991) and Orr (1996) rely on the notion of “situated activity” to explain their projects. (Orr also uses the terms “situated practice” and “situated action.”) They do not use them in the same way, however, and the difference between the two gives us a chance to get a better understanding of the ways in which action can be “situated.” Orr, who explicitly attributes his concept of situated action to Suchman (1987), focuses on the way action is situated in its immediate physical context—hence the commitment to detailed descriptions of work and the places in which it occurs, as well as the stress on the importance of the reps’ physical presence near specific machine and their ability to hear their characteristic sounds. Lave & Wenger (1991), on the other hand, reject a similar notion of situatedness, comparing it to “naive views of indexicality” (p. 32). While their understanding of situatedness is not defined as clearly as Suchman’s and Orr’s, it is clear that the book shows less interest in place and minute details of activities. Instead, it looks at learning as situated in the larger context of practice—that is, situated in a social world of action and in history of the practice, rather than in physical space understood narrowly.<sup>90</sup>

My approach to situatedness integrates Lave & Wenger’s and Orr’s, looking at the work of Brazilian software developers as situated simultaneously in two different contexts: the local one, similar to the one described by Orr, and the more abstract context of a practice based far away—in fact, the very place within which Orr’s ethnography is situated. I stress that we can only understand their practice if we look at those two contexts (and those two kinds of situatedness) side by side and examine the contradictions between them.

## A Synthesis

This dissertation takes as a point of departure the notion of “work as practice,” recognizing that work often involves simultaneously an economic relationship of employment and a membership in a community of people who engage in similar work and share certain technique, culture and identity. Work is thus subject to both cultural and politico-economic analysis, and the two must often be performed simultaneously.

At the most basic level, practice can be understood as a system of activities in which a group of people engages. Members see some sort of meaning in the activity and participation in the activity forms part of their identity. Those activities may be recognized as valid and meaningful by some people who do not engage in the practice, though such people’s understanding of those activities is likely to differ from the member’s own understanding. The activities that comprise the practice and the group of practitioners often mutually define each

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90 All of Lave & Wenger’s examples involve communities bound by place to some extent, and for some the place is mentioned explicitly (“Yucatec midwives,” “Liberian taylor”). However, the role of place is not discussed explicitly.

other: the group is typically understood (by both insiders and outsiders) as a group of people who engage in the activities, and at the same time the activities are considered a part of the practice to the extent that the group engages in them.

The meaning of the practice is typically defined in relation to other practices and the practice often has a place in a larger division of labor. Those relationships can be economic or non-economic. They can also be cooperative or antagonistic. A practice sometimes needs to be understood by its relationship to “client” practices; in other cases, it needs to be understood in its relationship to its “anti-practices.” For example, the practice of investigating drug traffic cannot be understood in separation from the practice of trafficking drugs. Cooperative relationship with other practices must not be understood as necessarily equal and fair. They may well be exploitative, and the balance of power between practices may vary widely.

Practice typically involves transformation or manipulation of certain objects as well as transformation of people from outsiders into members. Successful manipulation of the objects (per group’s and its clients’ definition of successful) requires a particular perception of the objects and situations and application of certain techniques to them. This involves doing things outsiders usually do not do. The application of technique may presuppose access to tools, which embody certain aspects of the practices heritage.

The novice’s entry into the practice requires acquisition of perceptions and technique, as well as access to tools. The perceptions and the technique can only be fully acquired by engaging in the practice together with the more experienced members. (Later development of perceptions and technique requires continuous engagement in the practice together with other members.) Such participation is often possible because the members recognize the need to bring new people and allow novices to engage in peripheral tasks that gradually lead them to fuller participation. It may also be possible because old-timers benefit from the work carried out by the novices. The relationship between old and new members can thus be unequal and exploitative, and the group of practitioners will likely more generally be characterized by a system of power relations.

The need to engage in the practice together with other practitioners requires that the practitioner is recognized as a member (or at least as a member-in-training) by other practitioners. Member-defined boundaries are important for this reason. However, certain groups of outsiders may recognize specific groups of practitioners as legitimate providers or consumers of certain objects or services (further recognizing their right to engage in the activities that are involved in the practice). Since such recognition is done at the level of a group, being recognized as a member of the group by *outsiders* may have consequences for the individual’s ability to engage in the practice. While outsiders may often rely on the membership judgments made by the members themselves, we cannot assume the insiders’ and outsiders’ understanding of the group’s boundaries to be the same. Members engage in “boundary work” to bring outsiders’ understanding of group’s boundaries in line with their own.

This synthesis provides a foundation of a discussion of work as practice, but suffers from an important flaw—failure to theorize the relations between practice in different place. The next chapter presents a slice of my own ethnography, which I hope will expose this problem. I then return to theory in chapter 1.3, presenting a theoretical account that tries to make up for this failure. Parts 2 and 3 of the dissertation then put more ethnographic flesh on the theoretical

skeleton presented in chapter 1.3.