

# Foreign Knowledge in the Work of Brazilian Software Developers

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## ABSTRACT

The dissertation uses ethnographic interviews to look at the role of computer-mediated access to “foreign” knowledge among software developers in Rio de Janeiro Brazil. The analysis focuses on the simultaneous participation in local and global networks, the boundaries between the local and the global experienced and drawn by the developers, cooperative local use of abstract global resources, and the role of national identity in mediating the interaction between local social processes and the global ‘knowledge’ accessible through the computer networks.

## 1. INTRODUCTION

Over the last several decades, social science literature has been increasingly stressing the emergence of global “knowledge society” and “knowledge economy” and the effect of this development on developing countries. Since mid 1990s the growth of computer networks has raised the questions of whether access to online resources will end up helping peripheral regions catch up (or even “leapfrog”) in technological development, or leave them on the wrong side of the “digital divide.” The question of interaction between distance and communication has specifically been raised in CSCW literature, reaching a consensus that “distance matters” [1] and that computer mediated communication is most fruitful when it occurs among people who also have face-to-face contact. There is a need, however, for rich ethnographic investigation of the role that computer-mediated access to foreign knowledge plays in the life and work of professionals in developing countries. Such an account needs to consider a broad range of social factors and social theory while paying the kind of close attention to computer-mediated communication that has characterized the CSCW literature but has been unfortunately absent in some of the broader sociological writing on the topic. Such work will contribute to both the sociological understanding of global diffusion of innovation and also to CSCW by introducing notions that are not typically discussed in CSCW.

In order to provide a rich ethnographic account, the dissertation focuses on the experience of a particular type of professionals in a specific place – software developers in Rio de Janeiro, Brazil. I look at software developers partly due to my own personal experience with this field, partly due to its recognized economic role (software has been chosen as one of the priority export areas by Brazilian government), but also because the practices of computer programmers in regards to use of IT may offer insights into what may become common in other communities later, since most of the currently ubiquitous forms of computer -mediated communication (email, the web, instant messaging) were first

adopted by computer programmers. Rio de Janeiro is interesting as a case of a “semi-peripheral” city with a thriving knowledge economy that is not at the same time one of “global cities” like London, New York or Tokyo. Unlike truly peripheral regions, Rio de Janeiro has much of the necessary physical and social infrastructure necessary for software development (broadband access, a functional university system, government research funding), even if it is only accessible to a somewhat small “middle class.” The problem for Brazil is thus not how to build technology at all, but how to stay “up-to-date” (*se manter atualizado*) with a constantly moving world of technology when much of the development is occurring thousands of miles away. This problem is faced both by the country as a whole and by the individual programmers who are increasingly judged by “global” (i.e., foreign) standards, and whose social practices are increasingly organized around remote “Meccas” of the global software world. Such remote technological centers serve as sources of both knowledge and legitimation for local practices and call for careful boundary work that reconciles their foreignness with their centrality to the local technical practice.

## 2. FIELDWORK

In the first round of fieldwork, I conducted 50 ethnographic interviews with software professionals in Rio de Janeiro, over the course of five months, from July to December 2005. The interviews lasted between 45 minutes and 2,5 hours and included a discussion of education and career history, current job functions, and detailed examples of some of the things that the participants learned more recently, including cases of “important” and “trivial” learning. The interviewees were recruited using a theory-driven snowball sample, which aimed to include a wide range of work environments and levels of expertise. The sample thus included developers and system analysts working for small and large private software firms, public enterprises and universities. It also included a number of people writing software for academic research. I interviewed people with a wide range of expertise, from self-educated novices to computer science professors with doctoral degrees from outside Brazil. Most of the interviewees either had higher education or were nearing the end of a university program while working full-time. In addition to those formal interviews I’ve conducted less formal conversation with about 20 people involved with Rio software industry in other roles (e.g., funding agencies) to get a wider view of the industry.

I plan to conduct a second round of fieldwork (3-6 months) in Rio de Janeiro in Spring / Summer 2007, in which I plan to discuss with my interviewees (old and new) some of the themes that has come up in the analysis of the data from the first round.

### 3. ANALYSIS

My analysis of the data focuses on an intertwining of three main themes: knowledge and communities, globalization and peripherality, and national identity.

While some of the discussion of the “knowledge economy” still relies on trivialized and mechanized understanding of knowledge, since the late 1980s “knowledge” has been increasingly recognized as a somewhat ephemeral entity that permeates work and cannot be easily separated from the practices and the relationships that bind the practitioners. In particular, the concepts of “situated learning” and “communities of practice” [2] have become popular in thinking about professional knowledge in the social sciences. I take this paradigm as a starting point for understanding the knowledge economy and look to refine its application to the new globalizing world.

I look at individuals as simultaneously participating in several different types of professional communities - local, national and global – all of which are “communities” in rather different ways. Rio developers are tightly integrated into the local social and economic networks. In order to practice technology they need technology jobs – which they typically find locally. Trusted local friends are crucial source of advice and talking about technology with friends over a beer is a crucial component of “keeping up” with technical change. At the same time, the developers stress that their practice is global and that what they do is hardly different from the work of engineers in California. (“A server is a server,” says one of my interviewees.) They spend much of their time searching for documents authored thousands of miles in a foreign (or, as some say, “international”) language. They are thus in an important sense a part of the “social world” of global software [3] while forming a distinct and highly localized “occupational community” [4].

The work of Rio software developers involves daily contact with the “global” practices while at the same time being crucially linked with the local networks. Their practice is thus *simultaneously* local and global. Moreover, the global is not merely a larger container for the local. Rather than looking at Rio engineers as participating in the global practice through their “local chapter,” I see them as involved *directly* in the local and global networks.

Simultaneous engagement in local work networks and global networks of abstract “knowledge” implies daily movement between a local group of trusted and familiar associates (who, however, are assumed to be limited in their knowledge), and global repositories of information which potentially contain answers to all questions, yet present them through texts of questionable authority and relevance. The individuals aim to combine the resources of those networks by resorting to the global networks for abstract knowledge which is then interpreted, evaluated and shared locally. Consequently, local networks affect the experience of the global “sources of knowledge,” while the presence of the latter also transforms local interactions (e.g., by allowing one to “do one’s homework” before asking questions).

We cannot understand the interaction between the local and the global without also considering *the national*, however, as national identities influence the ways in which global knowledge is brought into the local practices. They do so in two ways: historical

nationalist projects have shaped Brazil’s integration into the global and defined the extent to which the global is present in the lives of today’s developers; national identities of today’s engineers then further affect the way they make use of the historically constructed globality. Rio software developers clearly see themselves as *Brazilians*, and they are quick to point out the ways in which their work is affected by the “situation in the country” and “the national culture.” My interest here, however, is not as much in looking at the Brazilian nation-state as the level of analysis, but in considering the role that the “national imaginary” plays in orienting local practices towards or against the global and in determining how individuals find their places in the global world. The actual “situation in the country” may in fact affect how the global practices are brought into the local context, but it is even more important to look at how *the very notion* of “the country” (“*o país*”) affects their orientation. I see this idea of the “national” as not only historically recent but also as currently being re-negotiated in the new globalizing world, as individuals’ needs *vis-a-vis* the global may be in tension with their needs as “a nation.”

### 4. EXPECTED CONTRIBUTIONS

In addition to contributing to general sociological discussion of globalization by bringing in a more detailed discussion of the role of computer-mediated access to knowledge resources, the dissertation contributes to CSCW literature by showing specific effects of factors like national identity on the use of the Internet. I argue that the tensions between the national and the global make full participation in the global problematic, and require specific rhetorical work and careful demarcation of appropriate and inappropriate practices (“boundary work”), which in turn affects how global knowledge – and specific resources – is reproduced and reused locally. For example, in a forthcoming paper [5] I show how foreign discussion forums are often seen as good “sources of knowledge,” that is, *asocial* repositories of documented solutions where one can find ready answers to questions, rather than as “communities” that one can be a part of. The latter role is often reserved for Brazilian (or local) forums, which, however, are often seen as lacking in “knowledge.” Importantly, proper use of local and foreign forums is enforced through “boundary work” through which individual transgression may get censured.

### 5. REFERENCES

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