

# Foreign Knowledge in the Work of Brazilian Software Developers

Yuri Takhteyev

UC Berkeley School of Information

102 South Hall, Berkeley, CA 94720-4600

+1 650 281 7360

yuri@sims.berkeley.edu



## ABSTRACT

My work 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 computer networks.

## 1. INTRODUCTION

The dissertation looks at the use of online technical documents by software developers in Rio de Janeiro, Brazil. I ask how the foreign nature of such documents affects their incorporation into developers’ work and into the larger process of local re-creation of global technical knowledge. My work is closely linked with the original goal of information science of 1960s – understanding and supporting effective diffusion of scientific and technical knowledge. I extend this project in two important ways, however, responding to two challenges faced by 21<sup>st</sup> century informatics. First, informatics must consider the informational experience of people in other countries as well as the exchange of knowledge across national boundaries. Second, as knowledge and information technology are increasingly discussed in other disciplines and as we come to recognize the social complexity of the use of informational resources, informatics must interface with adjacent disciplines such as economics, sociology and anthropology, aiming to both draw on their resources and contribute to their discussions.

My research aims to contribute to extending informatics along both types of “globalization” by looking at the cross-cultural re-use of technical knowledge while critically engaging with related work in several adjacent disciplines, aiming to bring in needed concepts that are not usually discussed in information science (e.g., national identity) while also looking for information studies theories and methods that can contribute to the larger discussion of globalization and knowledge work in the social sciences.

In order to provide a rich ethnographic account, the dissertation focuses on the experience of a particular type of professional 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 the Brazilian government), but also because the use of IT by computer programmers 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 the “global cities” like London, New York or Tokyo. Unlike truly peripheral regions, Rio de Janeiro has much of the 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 [1]. 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 histories, current job functions, and detailed examples of some recent learning experiences, 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 a higher education degree or were nearing the end of a university program while working full-time. In addition to those formal interviews, I’ve conducted less formal conversations 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 will conduct a second six month round of fieldwork 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 have 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 the general sociological discussion of globalization by bringing in a more detailed discussion of the role of computer-mediated access to knowledge resources, the dissertation also contributes to informatics by showing specific effects of factors like national identity in the re-use of technical information. 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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