Using Foreign Forums

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Abstract

The paper considers the use of online technical discussions by software developers in Rio de Janeiro, Brazil, drawing on the results of a 5 month interview study. In the course of their daily work, Brazilian software developers routinely rely on online resources, which include as a key component foreign forums dedicated to technical questions. In rare cases, they actively participate in those forums; somewhat more often they "lurk." Even more often, however, forum posts are simply found while searching for a specific topic. Forums are thus experienced not as intertwining threads of conversations, but rather as a searchable collection of questions and answers free from conversational context, which is appreciated in a detached, asocial way.

The paper thus looks at the use of persistent conversations by people who are not party to them – not even as lurkers. It considers some of the reasons for such non-participatory use, including the reasons one would presume to be universal (e.g., the ease of searching), as well as those that may be specific to members of peripheral communities. The paper contrasts the forms of engagement with foreign and local (or national) technical forums, showing how foreign conversations are construed as asocial "sources of knowledge" while local forums are seen as spaces that bring together national or local communities of developers.

1. Introduction

Over the last several years researchers have looked at the ways conversations change when they occur over a medium that makes them persistent, thus stretching them in time and opening the discussion to a wider range of participants (Erickson & Herring 2006). Such work has looked at different forms of participation in persistent conversations, identifying for instance, two different types of authors in technical newsgroups – those who ask a few questions and disappear and those who stay continuously with the group, answering many questions (Fisher, Smith & Welser 2006). Some authors have also considered the role of the "silent participants" in such forums, members who read but do not write, commonly called "lurkers" (Nonnecke & Preece 2003; Rafaeli, Ravid, & Soroka 2004). All such literature, however, has focused on *participants* in newsgroups and mailing lists, stressing, in the case of the lurkers, their membership in the social context of the conversation and their sense of belonging. While it has been recognized that persistent conversations often produce lasting documents that may be seen *outside* the social context of the conversation (Erickson 1999; Erickson & Herring 2006), most of the work has focused on the effect that such visibility has on the *authors* (e.g., boyd & Heer 2006), rather than on the "invisible audience" itself. Additionally, most of the prior work has looked at persistent conversations occurring in the United States, in English.[1]

This paper draws on ethnographic interviews with software engineers in Rio de Janeiro, Brazil, to describe the experience of people who can hardly be described as "participants" or even "lurkers" in persistent conversations occurring in the US, yet whose work is profoundly affected by the traces of technical discussions occurring outside their country. I argue that the full significance of persistent conversations thus cannot be understood without considering such groups, who often have limited commitment to any one particular thread or discussion forum yet are affected greatly by the totality of archived – and *searchable* – technical conversations. The research on persistent conversations thus needs to consider both the role of such conversations in the lives of non-participants and the technologies and practices that enable such use.

[1] Paolillo (1999) provides a notable exception to this rule, looking at the case of language contact on IRC, though the participants were still mostly US-based.

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Persistent conversations need to be seen in the context of larger technological systems, which also include as a their key component search technologies, as well as in the larger context of local work-practices and knowledge re-use.

We also need to ask why those non-participants do not take part in the discussion from which they benefit so much. Such reasons can be reduced to the ease of finding archived answers and the desire to maximize return on ones time investment by using forum archives. I argue, however, that a deeper analysis of the underlying meanings is needed, as we must understand why the logic of "return on investment" is applied in some contexts but not in others. When looking at the use of foreign forums, we must consider the issues of national identity and cultural boundaries that allow certain forms of engagement while proscribing others. In particular, while foreign forums are framed by Brazilian developers as asocial information systems some of the local forums are seen as social spaces. To understand this process we need to consider larger issues of national identity and economic peripherality. The latter themes bring an international perspective to what has often been a US-focused discussion.

The paper is based on 50 ethnographic interviews with software professionals in Rio de Janeiro, Brazil, conducted from July to December 2005. The interviews focused on the knowledge such professionals need to do their work and on how they acquire it. Each interview 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. While the interviews did not focus on use of the Internet *per se*, they invariably contained a substantial discussion of the interviewees' use of the Internet since the Internet was mentioned as an important source of learning by all interviewees.

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.

The interviews were conducted in English or Portuguese depending on interviewees' level of comfort with spoken English.[2] The original Portuguese text of the quotes used in this paper is available on my web site.[3] The transcription and translation of all quotes were verified by a native speaker of Portuguese.

Such interviews cannot give a detailed understanding of the mechanics of persistent conversations of the kind that one can gain from forum logs, since the interviewees often have dim memories even of the more recent encounters. They do, however, provide rich context for engineers' engagement with such forums. Furthermore, the context they provide is quite different from the *conversational* context considered in most of the prior literature. Rather, the interviews situate such encounters in the context of developers' work from which their engagement with the forum is often but a brief detour.

2. Engineering work in the Age of the Internet

Modern software engineering work has been transformed by the wide availability of codified technical knowledge on the Internet – an effect that I personally observed in Brazil as a researcher and in California as an engineer.[4] Much of this content is produced in online forums and represents a fossilized trace of what was once live conversations. Forums, however, represent one of many genres of technical writing on the web, and developers often have little preference over the genres. In most cases, they do not go on the web looking for forums – they look for answers to their questions, and forums just happen to be a place where such answers are commonly found. For this reason, I start with a broader look at some of the ways Brazilian engineers work and look for answers to the technical questions that they encounter, before considering more specifically the role of online forums.

[2]As my Portuguese became more fluent over the 5 months of the study, my interviewees grew more reluctant to speak English to me. Thus, some of the interviewees that were conducted in English in August probably would have been conducted in Portuguese if they were to happen in November.

[3]http://takhteyev.org/brazil2005/quotes/hicss-40/

[4]See Duguid (2005) for a recent discussion of the question of codification of knowledge.

The following story told by a Brazilian developer illustrates what appears to be a common pattern, and includes several common themes such as the importance of Internet search, how it competes and complements "social search" through colleagues, and the way that search technology mediates access to online discussions. The story starts when I ask "Flavio" what he typically does at work and he answers:

> Flavio: Most of the time I am developing. But to develop is not just to write code, right? There is also a large part of searching, studying, looking at specific topics, finding answers to questions, looking for references. There is also this set of things.[5]

When I ask him to illustrate his point with a recent example, Flavio says:

> Flavio: I'll talk about something specific, about a problem. I was getting an error while doing a database search using Hibernate.[6] And I couldn't find where the error was. [...] So, to resolve this, the first thing is to look at the actual product reference documentation, right?
> Yuri: Which product?
> Flavio: Hibernate itself.
> Yuri: On the Internet? In a book? What kind of documentation?
> Flavio: A document on their own website. An API for the actual Hibernate. Hibernate's own documentation. On their website. When I didn't manage to resolve it, I asked the colleague sitting next to me.

Flavio ends up talking to several colleagues, but none know the answer. He comes back to his seat:

> Flavio: So I came back and tried modifying my program in such a way as to avoid this potential error. Then, however, we[7] ended up finding out that it was a problem of incorrect usage, I was actually using a wrong parameter. A problem with [unclear].
> Yuri: And you found this by...
> Flavio: Going back to the documentation, reading a discussion forum, reading the actual forum of Hibernate. [...] I wasted a lot of time looking for this information until I found it.

Thus, after failing to resolve the problem based on his own or his colleagues' knowledge, Flavio looks on the web, where he eventually finds a satisfactory answer in the archives of a forum. While he mentions that he "wasted a lot of time" looking for the information, the method he uses to find it is so mundane to him that it hardly requires an explanation. I have to ask him to tell me more specifically where and how he found the solution.

> Flavio: On the actual forum, using Google. A great source of information is always Google.
> Yuri: You started with Google and searched...
> Flavio: ...for specific information that I would need there. Some phrase that would tell me what was the solution. A parameter [unclear].
> Yuri: And this took you to the forum that explained..?
> Flavio: Yes, inside the actual forum someone had already had this problem and had given a solution which... more or less what I ended up using. And that was it. In fact, I just needed to reformat a parameter, readjust it to resolve this problem. The problem wasn't as complicated as it seemed.

Flavio thus looks for an answer through Google, a standard starting point for most inquiries for almost all interviewees - it is "always Google," as Flavio says. In fact, while the interviewees usually assert emphatically the importance of Google in their experience of the web, they rarely bring it up until asked to be specific about how they look for information. To a large extent, Google has become a part of the invisible "infrastructure" of the web that is simply not worth mentioning - "looking for information" ("procurar informações") is usually *understood* to mean doing a Google search. As use of Google sinks into the sphere of "unremarkable computing" (Tolmie, Pycock, Diggins, MacLean, & Karsenty 2002) in both Brazil and US,[8] researchers must be particularly careful to bring it back into the foreground and consider the ways that search technology shapes the experience of other technologies, such as web forums. Web forums, in other words, do not stand on their own, but are encountered by many users as a part of a larger technological system, which includes as another key component the search engine.

Most importantly, the search engine allows Flavio to find a *specific* forum post, making his interaction

[5] See http://takhteyev.org/brazil2005/quotes/hicss-40/ for the original Portuguese text of the quotes used in this paper.

[6] A popular framework for accessing database records as Java objects.

[7] While Flavio says "we" ("a gente") it appears from what he says later that he found the solution on his own. Many other developers similarly talk in collective terms about work done individually. This usage seems to express commonality of goals and importance of helping each other, despite the fact that the developers spend most of their time working individually.

[8] In contrast to Brazilians, speakers of American English have turned "google" into a verb (something that Portuguese speakers only do as a joke). Both linguistic strategies, however, mark the use of Google "unremarkable."

with the forum rather short-lived (though still longer than he wanted). His experience of the forum is thus embedded not in a larger history of social interactions in the forum, but rather in his work place, which is where he faces a problem, discusses it with his colleagues, and from which he makes a brief excursion into the virtual space of the forum to find specific parameters for his function call. The forum is thus not a social space, but rather a repository of documents that are consulted as part of Flavio's individual work. Other interviewees similarly praise the value of forum threads as repositories of information, but often dismiss "reading" forums as a waste of time[9]:

> Yuri: Are there forums that you *follow*, that you read every day?
> Afonso: No, no, no, no, no, no, no. Because the quantity of messages that I would receive would be absurd. There are people who... The great majority send very simple, trivial questions. So, I used to subscribe, in the beginning I received the messages that got posted, but then I saw that it wasn't worth it. You get a lot of trash.

Instead, Afonso says he resolves "90%" of his problems with a Google search that takes him to a specific answer.

Some interviewees may occasionally ask a question in a forum as a last resort:

> Afonso: And if you don't find it anywhere, then you go into... Because forums are annoying, it takes longer, understand? You have to wait for someone who has had the problem, who knows how to answer this. Sometimes there is nobody who can answer. Sometimes you have to wait till the guy, the development team for that framework sees the message and tells you something. And they... this message of mine in the whole world. And sometimes the answer... It usually comes quickly. When it comes, it comes quickly. But it may not come.

Most others, however, say they never ask questions in forums and those who say they do typically cannot remember the last time they did so. Thus, while forum threads are *created* through a process that resembles a conversation, they are not experienced as such by most interviewed developers, who instead see them as a searchable set of documents. Furthermore, while some developers repeatedly find their answers in the same forums (Google brings Flavio back to "the actual Hibernate forum," with which he seems well familiar), many others find their answers in different places and talk about "the forums" in plural ("os foruns").

3. Return on investment

Why do the developers prefer searching to asking? On the surface, the reasons they give are not much different from what one might expect to hear from developers in California, and which have been mentioned in some studies of lurkers (e.g. Nonnecke & Preece 2003). As we shall see in the following section, however, a more complicated story needs to be told, which considers the specificity of software work in "peripheral" countries and has to do with the various types of boundaries between Brazilian and American professional communities.

Perhaps the most commonly cited reason for preferring searching to asking is the sheer ease of finding answers in archives: asking a question on a forum means waiting for a few hours or even days for an answer which may never come, while a search can often yield an immediate answer allowing one to move on with one's work. After mentioning that he learned a lot from Qualcomm forums, one interviewee clarifies that this did not involve any "direct" contact. When I ask for a clarification, he explains:

> Yuri: You never sent them questions?
> Francisco: No, not directly. What I needed I found there already in the forums in the questions and answers that were there.
> Yuri: And you didn't ask questions in the forums?
> Francisco: No, never got to that. I never got to trying this. Because I never needed to. Because for everything that I needed at the time there already were answers.
> Yuri: In general that's what you do?
> Francisco: In general that's what I do. [...] In general there are... It's like... (Laughs.) I've never had a problem that nobody else had, understand? I've never had a problem that nobody else ever had or resolved.

While reembedding "codified knowledge" back into the living practice presents well-recognized theoretical and practical difficulties (Giddens 1990; Brown and Duguid 2001; Collins 2001; Duguid 2005; Grudin 2006), it is clear that in many cases search among archived documents can be quite efficient (see also Grudin 2006), or at least is perceived as such in comparison to the available alternatives.

For Francisco and many other developers, the existence of forum archives is thus itself a reason not to participate. It is widely recognized that the problems

[9] A small number of interviewed developers see forums in general as trash and try to formulate their search queries so as to avoid forum posts, preferring other genres of technical documents.

they face have already been encountered by someone else, resolved, and *documented* in one forum or another. Francisco's answer betrays another key assumption, however: *there is no point in asking a question that has already been answered*. The Qualcomm forum is thus seen in a purely utilitarian way, as an *information system* rather than a social space. Francisco, Afonso and Flavio face questions in the course of their work and are simply looking for the fastest way to get them answered.

The developers often also face a choice between searching on the web and asking local friends and colleagues. They similarly often express preference for searching, yet offer different reasons, the most common one being desire to avoid "harassing" other people and wasting *their* time with questions that can be easily answered online, as well as the fear of being seen as "the person who always asks questions." They keep track of how often they ask others and try to get the most out of each "spent" question by doing their homework on the web beforehand.[10] This logic is rarely mentioned when talking about foreign web forums: the concern there is not so much with the wasted time of other forum members or the fear of asking stupid question – searching is simply *faster*. Once again, it appears that asking a question of a colleague across the table is a deeply social affair, in a way that interactions with foreign forums rarely are.

Such reasons for non-participation are similar to the reasons for "lurking" described by Nonnecke & Preece (2003) who discuss their interviewees' desire to "satisfy information needs" and noting that for some participants "information was more important than interaction." Combined with the desire to "maximize return on investment" by spending less time with the mailing list, such informational orientation made searchable archives an attractive alternative to the more active participation (p. 117-118). Like other studies of lurkers, however, Nonnecke & Preece stress lurkers' *membership* in the groups, which manifests itself in a sense of community and a substantial commitment to the group (p. 125-129). This analysis hardly applies to the uses of forums that I have described above. I thus stress, that while some information-oriented readers "belong" to the groups in which they seek information, many others do not. Furthermore, we must recognize the tension between the utilitarian and the communal orientations and understand the two ideal types (the active participant who comes for the interaction and the "passer-by" who comes for the information) before looking at the more complex case of lurkers, who in many cases may represent a transitional stage (Duggan n.d.).

The desire to maximize "return on investment," however, is insufficient for explaining either lurking or searching. Most of Nonnecke & Preece's interviewees "lurked" in some groups while posting in others and the same was true of many of my interviewees (see below). A explanation in terms of "return on investment" thus merely takes us to the next, more fundamental question: *why do people chose to view some online conversational spaces as just sources of information while treating others as communities in which they might "belong"?*

In the following section I attempt to explain some of the deeper reasons for participating or non-participating in online forums, contrasting the use of foreign forums with certain domestic forums that are described by their participants in an entirely different way. Such domestic forums are often seen as spaces to build a national community where reading (and even answering) trivial questions may not always be seen as a waste of time. The difference, I contend, has much to do with the boundaries that exist outside the seemingly open virtual space of the forums and with boundary work that is done by both Brazilian and foreign actors.

4. Peripheral communities

We cannot fully understand how Brazilian engineers engage with English-language forums without considering their position relative to such discussion and the boundaries that separate them from it. Software industry is distributed unevenly throughout the world, much of it occurring in the United States. While home to one of the largest clusters of software development in Brazil, Rio de Janeiro is hardly visible on the the world software map. It is thus "peripheral" in the colloquial sense of the word (i.e., not seen globally as particularly successful, important or "big") as well as in the sense of not being a part of a major cluster. The fact that Rio's software industry is dwarfed by larger clusters has important consequences for knowledge creation and reproduction, as the small size of the local software industry makes it likely that many technical problems would be encountered and solved outside Brazil before they are faced by a Brazilian developer, forcing interviewed developers to constantly look outside for technical solutions, and in particular to look for answers in discussions occurring in the more "central" countries. Brazil has also been described as peripheral (or, more precisely, "semi-peripheral") country in the World

[10]See Takhteyev (2005) for a more extended discussion.

Systems / Dependency Theory sense, i.e. occupying a subordinate role in the modern economic order (Evans 1979). More specifically, Evans (1979) describes Brazil as "dependent," borrowing Dos Santos' definition of a dependent country as "one whose development is 'conditioned by the development and expansion of another economy.'" While in Dos Santos' and Evans' case "development" and "expansion" primarily refer to economic growth and capital accumulation, the same analysis can be applied to "development" understood as technological development. In this case, Brazil's industry can be seen as "dependent" on other clusters in the sense that local technological change is largely determined by innovation occurring elsewhere. Brazilian engineers' use of foreign web resources is thus a case of knowledge transfer from the center to the periphery and is typically seen as such by the developers themselves. The world of Rio software developers is dominated by what Levine (1972) calls "Meccas" - remote geographical centers of the larger "social world" (Shibutani 1955; Strauss 1978) towards which the local social processes are oriented. Such Meccas serve as sources of legitimating power for local practices and arbiters of "success." Google's acquisition of a small Brazilian company in 2005, for example, was widely seen as the ultimate validation of Brazilian software industry.[11]

While the experience of American software developers working outside the Silicon Valley is also oriented towards the same "Meccas," what makes the experience of the Brazilian developers different is the set of clearly visible boundaries that separates them from such Meccas. Use of the Internet in particular requires a choice between demarcated "national" and "international" resources – a choice that American developers rarely face.[12]

One important boundary that separates the local and the global fora is that of language. "Central" forums typically operate in English, a foreign language for all interviewed developers. Many interviewees thus prefix the usual "you can find anything on the Internet" with "if you know English." In fact, they rarely mention the language of the content they read, e.g., Flavio's story in the previous section, told in Portuguese, makes no mention of the fact that all Hibernate documentation and forums are in English. The fact that technical documentation resources are consulted in English is treated as being just as obvious as the fact that Flavio's conversation with his colleagues is conducted in Portuguese.

All interviewed developers say they read English regularly and do so without difficulty, regardless of their ability to speak it. While it is possible that many Brazilian developers who cannot *speak* English nonetheless read it with ease, I suspect that many of my interviewees understate their troubles with English texts, presumably as part of their "impression management" (Goffman 1959) in front of a foreigner, since English proficiency is often all but equated with technical competence.[13] In some of the more frank conversations, however, even interviewees who spoke fairly good English reported difficulties with it. Two problems seem to be common. First, many report being able to read the "more technical" texts with ease, but experience difficulty with the more "conceptual" ones. Second, it appears that many interviewees have difficulty *expressing* themselves in English (even in writing), even if they can understand it well. Such asymmetric proficiency perhaps encourages the use of texts already available online instead of more active engagement.

Apart from the objective difficulty of participating in a discussion in a foreign language, the language difference has an effect of *marking* a boundary between communities and becomes another tool for boundary work (Gieryn 1983). Other marking devices are also common. Brazilian URLs and email addresses are marked with ".br" and Brazilian forums and chat channels often carry a "-br" suffix. Importantly, such labels not only identify the specific country, but are are

[11]In July 2005, just as I was starting my fieldwork, Google acquired Akwan Information Technologies, a Brazilian search engine company (despite its English name). I had been consequently advised by quite a few people to include Akwan in my study as an important case of success of Brazilian technology. Just like Chicago's artists in Levine's account are ultimately judged by their ability to sell their work to New York, being purchased by Google appears to be the ultimate form of success for a Brazilian software company. Google's symbolic power is further multiplied as the company serves as a remote Mecca of success *and* at the same time its search engine is widely seen as the main path to remote knowledge. Google is thus truly "the alpha and the omega" of the software world.

[12]The growth of outsourcing to India has brought the awareness of the external world to American software developers, but the perceived boundary between "us" and "them" is different here, as it makes the outsiders a threat from the periphery, rather than the remotel source of legitimation.

[13]The idea that good engineers must be able to read English was expressed quite commonly. Similarly, there was no doubt for me that most of my interviewees wanted to make it clear to me that they (and other Brazilians) are technically competent and fully "up to date," suspecting that the purpose of my study was perhaps to evaluate whether they were behind in technical knowledge. Many thus explicitly asserted their ability to speak or at least read English. Interestingly, while most developers argued for technical competence of "Brazilians" (in general), those who claimed mastery of English did so just for themselves. In other words, nobody ever told me that "Brazilians" in general read English with ease.

also a mark of peripherality – American URLs and forum names do not carry comparable labels (just as they are not distinguished from "international" forums by a difference of language).

Forums that are labeled as national or local are treated in a very different way from the "international" ones. Those who engage with such forums typically describe them as "communities." Many Java developers in Rio de Janeiro, for example, talk with enthusiasm about local Java group ("RioJUG") that hosts both real events and virtual discussion. Both are often discussed using the word "we" ("a gente") – "we discuss," "we bring" – and other words evoking a sense of community. Some talk about the community aspects of RioJUG explicitly:

> Yuri: And do you know many of the people from the community[14]?
>
> Rafael: From the group? Yes. Because when there are big events like Sun Tech Days, everyone gets together, drives in a "caravan," travels together, stays at the same hotel, understand? It really is a community, understand? Those are people who work in different companies here in Rio de Janeiro, companies that work with Java technology, right?

Participation in *virtual* discussions on the RioJUG forum extends this social interaction; the "exchange of ideas" in the forum is described with words like "solidarity" and "cooperation."

> Walter: The Java User Group, we created it in April 2002 with a goal of bringing together the key Java people here in Rio de Janeiro. So that when someone has a question that none of their peers at work, none of their partners at work can solve, he sends a question to the group and folks respond by email, etc. Beside the group, the forum, we have the monthly meetings. The monthly meeting promotes physical contact between people. You start meeting new people with different knowledge, get to know them. Also, those people become your friends and you can then call them to ask questions, etc. [...] And you form your community. And in return, they can also call you, because this is what is called "the law of cooperation." [...]
>
> Yuri: What does that mean?
>
> Walter: Solidarity.

Importantly, RioJUG participants talk about offering help to new users and are thus willing to read many "trivial" posts of the type that discouraged Afonso from reading some of the foreign forums.

> Walter: When I identify a question that someone asked, a question that is taking time to be answered, and I have the knowledge to answer it, I respond and give him some suggestions. Oh – we don't give a complete solution, right? Again, we say we try to give details about the path that the person needs to follow. The forum has unwritten rules, like any other community.

Walter thus not only takes time to track orphaned questions and respond to them, but takes special care to use his responses as a tool to socialize the new users into the ways of the community.

While RioJUG's sociality may be derived from its local focus and existence of face-to-face events, Cascavel-PM mailing list appears to be a case of a virtual community on a national scale. I was told about the list with much enthusiasm during a face-to-face meeting (with beer) of the local chapter of Perl Mongers. Started in a small town in the south of Brazil, Cascavel-PM ended up attracting members from many parts of the country and becoming a national mailing list with no face-to-face events on the same scale, yet it was also described as a community. The language used to described local and national forums contrasts sharply with the way foreign forums are talked about, the latter usually being described in pragmatic terms as "sources" of knowledge.

Local forums like RioJUG are rarely described as sources of knowledge. Those who participate actively usually stress "exchanging ideas" and helping new users over "getting knowledge." Those who don't often dismiss the quality of "knowledge" in such forums altogether:

> Mario: And the lists in Portuguese, they are for... Maybe this is my prejudice, but normally those lists have more people who are there because they don't know English. Because this is the only resource that they have.

Unlike Mario, who expresses his "prejudice" against Portuguese mailing lists explicitly, most other interviewees look for more subtle ways to communicate their view that such lists are not a place for keeping up with the changing world of technology stressing instead their value for getting to know the

[14] In this particular passage I make a mistake of inadvertently introducing the new term "community" ("a comunidade") into the conversation, instead of using Rafael's term "group" ("o grupo"). Rafael, immediately takes up the term and expands on its meaning ("It really is a community"). His enthusiastic use of the term as well his prior discussion of RioJUG leaves me confident, however, that while "community" is my term, it describes his experience quite well.

local community.[15]

Such division does not simply happen: it is constructed and reinforced through active boundary work. Those who take too active of a part in foreign communities may get censured. An interviewee who speaks fluent English and shows a clear preference for foreign forums and IRC channels tells me about a "funny situation" that happened to him:

> Antônio: I was in a Postgres chat channel and I was asking for some help, it was actually a GForge issue. Then a guy helped me out with some stuff and then I don't actually recall why we went to this, but he asked "Where are you from?" and then [it turned out that] the guy was Brazilian and he said "Well, why aren't you at the Postgres-Br chat channel?" He said it to me. And I said, "I wasn't even aware there was a Postgres-Br." It's not that... I don't have anything against it, you know, and I do think I could get very... quality answers from Brazilian forums. It's just that it's not a problem for me to go directly to the source because of the language. So, I tend to go directly to the developers and they tend to be American, or English is the language. But I don't really have anything against it.

Antônio gets censured for not participating in a Brazilian forum (labeled as such by the "-br" suffix). His defensive position ("It's not that I...") suggests that he recognizes the question as an accusation, and likely one he has heard more than once. As a Brazilian, Antônio is expected to be primarily involved with conversations labeled with "-br."

Antônio defends his behavior in pragmatic terms: it's not that he has "anything against" the Brazilian community, it's just that he feels he would get better information by going to "the source." His involvement in the international channel can thus be justified if it can be framed as a matter of an informational transaction, rather than participation in a community. Other interviewees who make use of foreign forums usually similarly stress their informational utility. Antônio's interest in "information" over "interaction" is thus not the ultimate cause of his participation, but is rather a part of a rhetorical strategy to justify his involvement with a foreign community to his compatriots.

Antônio's story raises a curious question about the Brazilian developer who censures Antônio. This developer is obviously involved with the foreign forum himself, so it might be unclear how he can take higher moral ground. Based on the conversations with other developers who engage with both types of discussions, I guess that he would justify his position by pointing out his role as a scout for the national community. Venturing outside to look for knowledge or even ask questions can be justified if the goal is to bring the knowledge back to the one's own community; one cannot forget, however, what that community is. The developers also look for other ways to "bring back" foreign knowledge (or frame their activities in such terms). A surprising number teach night classes, and while additional income provided by such work is an obvious incentive, many talk about it as a matter of "duty" - having acquired the knowledge, one must pass it on to other Brazilians.

Brazilian engineers thus seem to actively draw social boundaries between national and international forums, often taking one as a proper source of "information" and another as a community space. Given their quest for foreign knowledge and the growing recognition that learning comes only through participation (Lave & Wenger 1991), such self-imposed boundaries may seem irrational. I cannot offer here a full explanation of why Brazilian engineers draw such boundaries between themselves and the remote centers, rather than working to erase them. I will, however, briefly discuss two possible reasons: the recency of the current "open" regime of software development innovation and the limitations of its openness.

The roots of the current ambivalence about foreign technology likely lie in the larger dynamics of "imagined" national communities (Anderson 1991) and its particular historical manifestation in the form of "nationalist" development ideology (Adler 1987). Under such ideology, one's country is understood to be "behind" ("atrasado") and in need of "development" towards a globally-sanctioned goal, defined by the standards of the wealthier, more "central," nations, while those nations are seen in antagonistic terms. It inevitably implies ambivalence towards the foreign: the knowledge of foreign actors must be used, yet their intentions cannot be trusted.[16] Separating

[15]It appears that Mario has little appreciation for the social aspect of the national mailing lists in this case because his company is tightly linked with one of Brazil's major research universities and he thus has less need in building additional local networks. He *does* however participate in local and national mailing lists that are dedicated to the less technical aspects of his business and uses them as a source of business contacts, as well as some of the more exclusive lists within the university.

[16]Such "ambivalence" in Brazilian attitudes towards foreign centers and its relation with adoption of technology is discussed by Marques (2005), who writes: "The ambivalence around simultaneously copying and rejecting the models they imitate often brings those located in the contact zone between colonized and colonizers (such as Brazilian computer professionals) into a kind of *impasse*. They

"informational" needs from "belonging" becomes a one possible strategy for managing such ambivalence.

The national development ideology came to the forefront in Brazil (and many other countries) in 1970s as a result of disillusionment with the development efforts of 1950s and 1960s and a realization that economic and technological integration was creating winners and losers (Hirschman 1981; Adler 1987). It lead, among other things, to a long effort to create an autonomous computer industry (Adler 1987; Dantas 1988; Evans 1995), which had to balance the need for foreign knowledge with the lack of trust in foreign corporations. While the need for such policy and its outcomes are still debated, one needs to remember the context in which it was formulated. Modern software development arguably operates under an "open" regime of innovation, where much of the technological knowledge is openly available and where most of the innovation occurs *between* firms rather than within them. While the beginning of this system can be traced to the Silicon Valley networks of 1970s (Saxenian 1996), Brazilians had little option of participating in such networks.[17] Instead, they had to obtain technical know-how from multinational corporations like IBM, which, at the time, kept their technical knowledge tightly guarded.[18] The ambivalence about foreign communities may thus reflect failure to respond to the changes in the global regime of innovation.

We must also consider the possibility that the boundaries drawn in cyberspace by the community itself, reflect to some extent the boundaries that are still imposed from the outside in other spheres. While the Internet promises borderless participation, real-life national borders and the distance that separates Brazil from the United States and Europe ensure that most Brazilian engineers will never set their foot anywhere near Google campus. Widely perceived prejudice of American companies against Brazilian software also makes local work for remote markets an uphill battle, and unpaid contribution to open source projects is a luxury that most "peripheral" developers cannot afford.[19] The commitment to the national community thus may reflect simple realization that collectively the developers are stuck in a "peripheral" country that is likely to stay peripheral without the creation of *national* capabilities (*capacitação nacional*).[20]

5. Conclusion

A key feature of "persistent conversations" is their potential visibility to a wide range of people beyond those who participate in them. Looking at the experience of such "invisible audience" leads us to consider the broader contexts in which such conversations are used. I stress that online forums are often encountered just briefly and that it is important to understand such encounters in the context of the user's work rather than in the context of the conversations, much of which the visitor never sees (or would rather not see). We must also consider how such use of forums fits in the user's larger set of tools. Most of the interviewees in my study, for example, encounter fragmented pieces of forum discussions through Google search. The designers must thus think about persistent conversation technologies as a part of a larger technological system and may benefit from thinking of the forums as a "feature" of user's bricolage of tools rather than an "application" that is used by itself.

We must also consider why such visitors do not become active participants. The proximate cause is often simply the desire to save time. In many contexts, archived online discussions are simply seen as repositories of valuable information rather than social spaces. The user are brought to them while trying to get an answer to a question, and they often want to do so with minimum time spent interacting with the medium. They often want to get in, get out, and move on with their life.

simultaneously imitate and are hostile to the models they imitate. They copy to the extent that they accept the standards diffused by modernity" (p. 150). (Of course, the term "colonized" should be applied to white Brazilian programmers with much caution.)

[17]Even foreign-born engineers physically present in California found integration into such networks difficult until early 1990s (Saxenian 2006).

[18]IBM joined the Silicon Valley model in 1981 with the release of the IBM PC, which was based on outsourced components and open interfaces. This move occurred partly due to antitrust pressure by US Department of Justice (Saxenian 2006).

[19]Brazil has been quite active in *adopting* open source solution. Much of the excitement about open source in Brazil, however, comes down to the eagerness to replace foreign technology that is closed, costly and painfully "American" with a better foreign technology – one that is free (*gratis* first, *libre* second) and somewhat "international."

[20]Willis' (1977) study of counter-school culture among working class youths shows how such culture "penetrates" the dominant ideology of mobility, realizing, in particular, that mobility is not an option for the lower class as a whole and that mobility of the few is used as a justification for inequality. Willis points out, however, that the resulting orientation towards "working class" culture only damns the youths to the life of manual labor. To borrow Willis' approach, one can argue that the cultural forms of Brazilian software developers express a "penetration" of the ideology of openness and an insight into their real situation at the periphery. As with Willis' "lads," however, such penetration is limited and might only worsen the situation.

We need to also consider, however, why people see some conversational spaces purely in terms of their informational utility, while approaching others as social environments in which they might belong. This paper explores such distal causes for a particular context: software developers in a semi-peripheral region. I show how seeing foreign forums as "sources of information" and local forums as communities is part of a larger process of boundary work, necessitated by the ambivalence of peripheral perception of "global" technology. My analysis may be immediately applicable when considering other cases of "peripheral" communities. More broadly, it can be used as an example of looking at how pre-existing boundaries and on-going boundary work may lead to "informational" or "communal" orientation towards online discussions.

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