Rethinking Migration: High-Skilled Labor Flows from India to the United States

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Introduction

A qualitatively new organization of capital and labor is affecting migration practices in a way unimaginable a decade ago. In an ever-increasing global economy, information technologies are producing a form of migration that adds a new dimension to what is termed as "the international division of labor." This study explores the rapidly growing, but little researched, practice of on-line labor-flows from India to the United States, and compares it to the corresponding physical migration of programmers called body shopping[1]--a practice of bringing programmers from India to the United States, and arranging work visas for them to work on-site in the US. While on-line programming implies migration of skills, but not of bodies, body shopping implies migration of both bodies and skills. Comparing the software engineering projects undertaken on-line with those carried out on-site and examining whether information technologies can potentially render the migration of high-tech workers from India to the United States redundant, this study attempts a new perspective on prevailing immigration debates in the United States regarding high-tech workers by exploring the changing channels of labor supply.

As the majority of labor in the United States is increasingly being converted into information work—especially many industries in the service sector that occupy a large employment space in the economy, this research takes the on-line delivery of work across national borders as its object of analysis and integrates it with immigration issues. A study of relatively less visible processes of online, offshore labor—despite being difficult to study—offer a new conceptual hinge to the immigration debates raging in the United States. The debate whether the United States as a nation stands to gain or lose from immigrant workers—in terms of economic, fiscal, demographic or cultural consequences—has been intensifying for some time (Borjas and Freeman 1992; Espenshade and Hempstead, 1996; Friedberg and Hunt 1995; Smith and Edmonston 1997). Lately, a large demand and influx of IT (information technology) workers has forced the debate to enter the high-skilled domains of employment, as reflected in various media discussions. While the corporate world has continuously pressed the national government to relax the quota on labor immigration, arguing from the viewpoint of the shortage of IT labor, upward wage pressure, and competitive advantage (e.g., Gleckman

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[1] The term "body shopping," due to a certain negative connotation, is avoided in formal conversations. The more accepted term is "consultancy." However, I do want to retain the term because it captures the sense of bodily presence at the site of work.

1998; Moschella 1998), others fear that such immigration will take the high-tech jobs away from native born Americans and lower their wages (e.g., Archey and Matloff 1998; Matloff 1995 & 1996).

To illustrate the practical consequences of such debates, US Congress imposed a quota in 1991 to allow only 65,000 temporary workers on H1-B visa[2] to enter the country annually. The cap was part of a larger scheme to stem the flow of immigrants. In 1997, when the limit of 65,000 was reached before the end of the year, it triggered a divisive debate in 1998—under the pressure of an increased demand for high-skilled IT labor in a booming information economy—about whether the limit should be raised. The intensity of the debate is reflected in various bills that were introduced, defeated, revived, passed, and rewritten between the House of Representatives, the Senate, and the White House. The final bill that was enacted allowed 115,000 foreign workers to be granted visas for fiscal years 1999 and 2000; the number of visas would first drop slightly in 2001 and then revert to 65,000 in 2002. This American Competitiveness and Workforce Improvement Act of 1998 also required employers to pay a new H-1B worker fee of $500 in order to fund training and educational programs for U.S. workers. The 115,000 visas allotted for the fiscal year 2000 were exhausted in March 2000. The pressure on the government is so intense that there are a number of bills pending or stalled in Congress that propose to raise the cap further and more significantly. These debates on the future of immigrant IT labor will need to be reformulated, as this study makes visible the redundancy of border patrol against IT labor flows even as it confirms its strength against the flow of the bodies, i.e., physical migration. Using high speed datacom links, programmers based in their national territories can work on-line and in real time, on computers situated anywhere in the world, thus obviating the need for either labor or corporations to undergo the tedious process of physical migration. With an inquiry into the above practice, this study integrates the macro questions of transnational capitalism, migration, and the nation-state to the micro practices of software work conducted at a firm level.

This paper compares practices of on-line and on-site labor (body shopping) in terms of their similarity or difference. It also identifies certain core aspects of on-line, offshore labor, which is a relatively newer phenomenon with little research expended on it, and clarifies how on-line programming works. Rather than limiting the inquiry to the question "what" is achieved and accomplished through the new labor practice, or what the content of work is, or what competitive advantages corporations gain by hiring on-line labor, I begin by asking the question: "how" does this form of labor work? This question brings out the contours of a new regime of labor practice, which requires new analytical tools to understand transformations in work organization and labor migration. The structure of the paper is as follows. First, I explain how this study seeks to add an important dimension to discuss two separate bodies of literature: globalization and migration, followed by a brief description of research. Lastly, I explain the workings of body shopping and on-line labor.

Globalization and Migration

In some ways, recent debates on globalization corroborate the assertions of Fordist, post-Fordist and World-systems analyses about the ever-growing incorporation of scattered societies into the capitalist global system. Literature on globalization explains, on the one hand, the unprecedented expansion of transnational corporations, reflected, for instance, in such book titles as "Global Shift" and "Global Factory," (Dicken 1992; Kamel 1990) and the increased flow of commodities across national borders on the other (Knox 1995, p. 6). Transnational corporations, however, share an uneasy relationship with nation-states. As contemporary capitalism, with its transnational corporations, is increasingly able to penetrate into the sacred boundaries of

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[2] The H-1B is a non-immigrant classification used for a foreign worker who is employed temporarily in a specialty occupation. A specialty occupation requires theoretical or practical application of a body of specialized knowledge along with at least a bachelor's degree or its equivalent.

nations, the historical primacy of the nation-state as the primary regulator of its national economy is increasingly undermined (Johnston 1982). The world economy now is not merely undergoing a process of inter-nationalization--that is, an intensified networking of *national* economies--but also of globalization by supranational powers (Dicken 1992). Some scholars, however, recognize that the role of nation-states acquires more significance as nations try to enhance their strengths to compete globally with other national economies; they act as the source of the skills and technology that underpin competitive advantage (Chesnais 1986, p. 87; Porter 1990, p. 19). But most scholarship, in order to illuminate the transnational practices, moves away from state-centric models (Keohane and Nye 1973; Sklair 1995), though privileging by default the global over the local.

Faced with fiercer competition and higher wages in the developed world, corporations tend to move their standardized production to capitalize on low cost labor in the third world (Frobel et al 1980; Harvey 1989; Lipietz 1986). While cheaper labor may be only one of the factors influencing a corporation's move overseas (Dunning 1980; Elson 1988; Schoenberger 1988), all factors seem to eventually bring corporations, workers, and national states into "direct contact" with each other.

Although this study views emerging on-line labor as part of the common move in contemporary capitalism to tap globally dispersed labor in a more flexible manner, it departs from general literature in some important ways. First, on-line labor has very limited direct, physical, face-to-face contact with corporations in the United States. Second, on-line work cannot be understood as merely transnational in character, as it takes place within the bounds of nations. For instance, programmers in India, while indirectly working for U.S. corporations, still carry a single, unambiguous national identity unlike immigrant programmers who physically work in the United States; they do not go through the agonizing resistance of another nation faced by immigrant workers in terms of visa requirements, alien status, nativist reaction and cultural opposition (Cornelius et al 1994); third, programmers based in India are also governed by local practices of employment, taxation, and labor regulations. Yet, they do break national barriers by directly occupying some employment space in concerned sectors of the U.S., like other immigrant workers. In short, they migrate without migration, a phenomenon I prefer to call "virtual migration." The concept of virtual migration recognizes that the programmer sitting in India can actually access a computer in the United States, work on it and implement changes. Such invisible and disembodied processes of labor supply may add a new dimension to literature on labor migration.

Migration literature consists of macro perspectives that stress structural causes and functions of immigrant labor for developed nations (Boyd 1989; Burawoy 1976; Castells 1975; Pedraza-Bailey 1990; Portes 1978) through the articulation of international system (Portes and Böröcz 1989) as well as micro perspectives, such as Everette Lee's seminal "push" and "pull" theory of migration (Grasmuck and Pessar 1991; Lee 1966). Yet, with the growth of information technologies, there are new empirical and theoretical challenges facing immigration research. Recent technological advances have generated a curious phenomenon -- the textualization of work (Zuboff 1988), that is, work is mostly symbolic manipulation on the screen through software systems. The resulting dematerialzation of work, which can now be textually controlled through software, reduces the need for the on-site presence of the body to perform work. This research stresses the need to acknowledge the invisible, disembodied migration of labor, comparing it with well-documented processes of physical migration. Economic migration can no longer be seen only in terms of physical human movement. Some recent suggestions for a sociology of borders and flows (Böröcz 1997) provide new theoretical axes for a unified analysis of social flows--including capital, labor, bodies, commodities, cultural patterns, and information. Developing such perspectives may offer important analytical tools to compare embodied and disembodied labor flows across national borders. We may also draw upon Saskia Sassen's (1997) recent attempt to bring the issues of global economic regime, national state and migration together. She challenges two prevalent propositions: first, what the global economy gains, the national state loses and vice-versa; and second, if an event (e. g., business transaction etc.) takes place in a national territory, it is a

national event. The global economy, according to her, is not a phenomenon divorced from national states, and the national event is not merely "national." Offshore, online labor practice is a case, which fits perfectly into this hybridity of the national and the global.

Before any further analysis of the practice, it is expedient to briefly describe the 18-month field research conducted in 1999-2000 that informs this study. To gain grounded, contextualized, and ethnographic information about on-line labor practice, I conducted formal and informal, semi-structured and open-ended in-depth interviews with programmers as well as high-level management executives of many software firms in both India and the United States. In the first phase of research, the target group consisted of programmers and project managers in and around New Delhi. During the second phase, programmers as well as some high-level business executives were interviewed in New Jersey and surrounding areas. One of the important reasons to select New Jersey as a site of study relates to the presence of many high-tech corporations as well as many smaller companies that employ Indian programmers in large numbers. Most of the programmers interviewed in the U.S. immigrated through the practice of body shopping. In the last phase of this research in India, mostly high-level executives—such as CEOs, Managing Directors, and Vice Presidents of small, mid-size, and big software firms based in New Delhi, Gurgaon, and Noida (India)—were interviewed. During all the three phases, software development sites, corporate centers, and work processes of many software firms were closely observed. In India some of these firms include Tata Consultancy Services (TCS), Netacross, HCL, LogicSoft, Softek as well as some U.S. subsidiaries like Microsoft, Adobe, Metamore, and iDLX among many others. Many other forms of data were also collected, such as annual reports of the National Association of Software and Service Companies (henceforth, Nasscom), reports regarding information technology task force of the Government of India, and Information Technology Bill presented in Parliament.

The present study results from 50 formal interviews (35 in India and 15 in the U.S.) and an almost similar number of informal conversations with software professionals and executives in India and the U.S. For long interviews, programmers were selected through snowball sampling while higher-level executives were selected by contacting all the firms located in Delhi, Noida, and Gurgaon, listed by Nasscom in its directory of software firms. The response rate of higher-level executives was about 25 percent. Interviews were mainly conducted in two languages in which I have requisite proficiency: Hindi and English. This field research opens up an avenue of analysis whereby both physical and virtual migration of labor may be treated as parts of the same labor régime.

Bringing the Body to Work-site: Body Shopping and Onsite Labor

Our understanding of labor migration is generally situated within the framework of "body migration," a legacy of the times when labor could not move without the body. At the beginning of the new millennium, the continuous revolutionizing of the instruments of production has enabled a new labor regime whereby labor can move and migrate without the laborer's body. This is not to say that earlier ways of doing work are going to suddenly vanish without a trace. Just as the theater did not disappear after the cinema turned the acting bodies into moving pictures, virtual labor will not *entirely* replace onsite labor. At the beginning of the year 2000, the people hired through body shopping, requiring physical presence of software professionals at the site of work, still outnumbered the people providing their labor online from India. Their proportion, though, is gradually declining. Let us first look at what body shopping is and how it functions. One of my informants in India explained body shopping in the following words:

> Body shopping is essentially when people are sitting in some kind of recruitment shops in India…they're really sending out our talented people… they do not enter into any kind of service contract but only into contract for providing people on a temporary basis. So while those people

continue to work for their local company, they're deploying their services for an overseas customer, for a foreign customer on site."

Another informant explained it as follows:

> You can say, these are like headhunters... What they can do is they can get you an interview for all these big companies, if they need a full-time employee they can place you there. You work for them...[but] you do exactly the same thing.

Body shopping has a negative connotation, as reflected in above statements. There are two modes in which business and software executives in India talk about body shopping. First, those companies in India that do not engage in body shopping tend to not only deny having anything to do with it; they also consider it as inferior, though lucrative, business practice. They emphasize the fact that they are into real services (like developing software systems for various clients) and carefully avoid this sham—that is, not doing any real business, but merely placing software professionals with needy corporations in the U.S. Although almost all the big software firms in India could become big only through body shopping initially, the second reaction consists in how the companies—that do engage in body shopping—couch the practice in euphemisms such as "consultancy." More important than the self-image of software professionals is how body shopping in itself is a relatively unique phenomenon. Four important characteristics emerge after a careful analysis of body shopping and the nature of this form of labor:

- Just-in-time labor
- Higher earning but low cost labor
- Universal as opposed to specific labor
- Systems level labor

Body shopping demonstrates with extraordinary clarity what "flexible" forms of post-industrial labor mean and entail. This form of labor, I argue, is analogous to the application of the just-in-time (JIT) techniques developed by several Japanese firms in the 1970s to inventory management. The new systems drastically reduced large inventories and associated overhead costs throughout the entire production system by relying on careful scheduling of small, accurate delivery of parts and supplies to be made by vendors *just in time*. Quite like a large inventory, keeping a large workforce on permanent rolls with no regard to the seasonal highs and lows of business is a costly problem, which the practice of body shopping attempts to overcome in its own ways. By supplying software professionals in time and for the length of time needed, the body shopping firms help various companies avoid the costs of keeping a large workforce on a permanent basis. One of my informants, working for an American investment and banking company through a body shopping firm, explains it in the following way:

> What happens is that this company doesn't have to hire an employee. They don't have to pay for my insurance. And they can fire me. I'm not a liability for them. But in [re]turn they have to pay more money. ... the other thing is if they hired a full-time employee they will have to train him [or her].

The above statement also resolves the seeming paradox of higher earning and low cost labor. Although contractual workers placed with different companies by their parent body-shopping firms may be earning more in the short term, they are still low cost labor from a long-term perspective. While annual contracts fetch these temporary workers higher income than annual salaries of regular employees in similar positions, they allow the receiving company to trim its workforce, take these temporary workers into service only in times of need, and economize on long term benefits—like retirement contributions and health insurance—that it is required to pay to its permanent employees. Another characteristic of this just-in-time software labor is its universality. Unlike specific forms of labor, such as a surgeon's labor or a civil
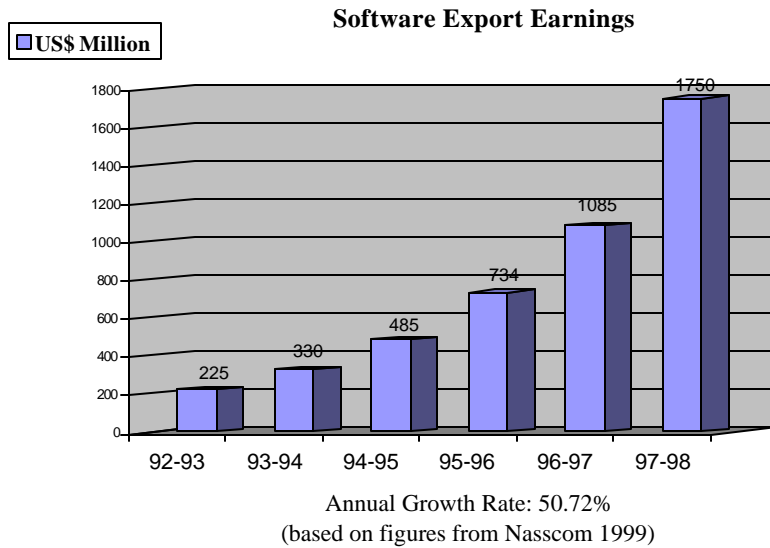
engineer's expertise, software professionals are not limited to any specific form of organization or industry. Software is fast becoming the medium and language of all work. Whether to control heavy machines or track everyday banking operations, software professionals lend their labor and expertise to an unprecedented diversity of businesses. This explains the phenomenal growth of body shopping in the software business. In view of more universal application of their work, programmers can be quickly deployed, transferred, and redeployed in different firms. However, the universality of programming is not like the universality of secretarial work in diverse organizations. Unlike secretaries, software professionals are systems-level workers, that is, they can potentially transform how organizations function from within. As programmers, they not only help translate the previous work set up into a digital format (e.g., converting face-to-face banking system into an online banking set up), they also help transform—in their capacity as systems analysts—some fundamental aspects of how an organization functions; e.g., reconfiguring various departments and hierarchies through Enterprise Resource Planning (ERP) systems. Using ERP systems, software professionals can chalk out a new workflow, identify redundancies and duplication, and mechanize the whole work process from the designing stage to the shop floor.

Surprising as it may seem, body shopping is not flexible enough for the emerging labor paradigm, as it still involves actual border crossing and authorization by the nation-state. Online labor emerges as an alternate and even more flexible form of labor movement from India to the United States, seemingly bypassing the state by confining the laboring body within the geographical jurisdiction of the state. This virtual flow of labor provides a unique site from where to explore relationships between transnational capitalism, nation-state and labor migration.

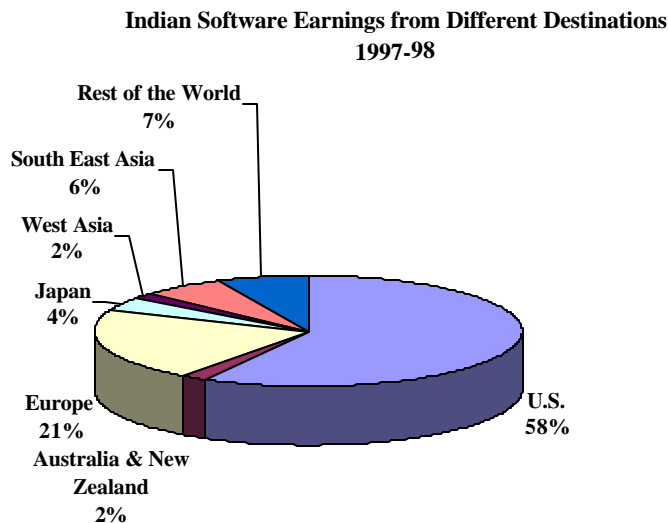## On-line Labor: The Local Setting of the Global

Although Indian software industry is more than twenty years old, it is only in the last decade that the industry has taken off and only in the last 5-8 years has India become a global player. These are also the years of the emergence of on-line labor. There are three basic features of this on-line, off-shore software engineering -- 1) the programmers in India are connected to clients' machines in the US through 64 Kbps and above satellite links and Internet/e-mail; 2) where the situation demands, the client is able to monitor the progress on a continuous basis, implement quality checks and communicate with the programmers and analysts, as if they were on site; 3) since the US and India have an average 12-hour time zone difference, the client enjoys—for certain software projects—virtual round-the-clock office hours. Although some Indian companies are moving up the value chain, these on-line projects specialize not in packaged products, but in re-engineering projects and high-skilled services, chiefly providing high-skilled information labor to the companies around the world.

There is an ever-growing number of companies in India that organize programmers to provide on-line software labor to corporations in the United States and other countries. By December 1998, more than 109 Indian software firms had acquired international quality certification (Nasscom 1999). Some well-known U.S. firms that figure in the client list of these Indian firms are Intel, Merrill Lynch, AT&T, and IBM among many others. According to *The Economist* (1996, p. 32), "More than 100 of America's top 500 firms buy software services from firms in India, where programmers are typically paid less than a quarter of the American rate." By 1998, Indian software providers have already captured an 18.5 percent market share in global cross-country customized software work, and the Indian IT sector has consistently achieved more than 50 percent compounded annual growth rate since 1991 (Nasscom 1999), as can be seen in the figure below:

Software Export Earnings

US$ Million

	92-93	93-94	94-95	95-96	96-97	97-98
US$ Million	225	330	485	734	1085	1750

Annual Growth Rate: 50.72%
(based on figures from Nasscom 1999)

Earnings from software exports are projected to gross $9 billion by the year 2001-02, while the National Task Force on Information Technology—a support arm of the Indian government—has set a target of $50 billion of exports by 2008 (Nasscom 1999). It must be noted that these US dollar earnings assume even bigger proportions on conversion into the Indian currency (Rupee) in terms of their purchasing power.

The software relationship between India and the U.S. is particularly significant. Just as India is becoming the largest supplier of software labor to the United States both in terms of body shopping and of online labor, the U.S. has turned out to be the largest source of foreign exchange earnings for India as shown in the following figure:

Indian Software Earnings from Different Destinations
1997-98

Rest of the World 7%
South East Asia 6%
West Asia 2%
Japan 4%
Europe 21%
Australia & New Zealand 2%
U.S. 58%

The mutual importance of the US and India for each other is reflected in the following statement of one of my informants, a spokesperson for the National Association of Software and Service Companies (NASSCOM):

…we can't deny the fact that the U.S. is a major market for our software industry and in fact…nearly 64 percent of the total software exports for the year 1999, we expect to be derived from the U.S. market alone. So we just can't deny the fact that it's the largest market in the world. It continues to be a major driver in terms of innovation and new technologies, and dictating, I would say, new standards for the global IT industry, but also for the fact that over a period of time Indian software talent, the Indian software talent pool, has been really able to achieve a certain recognition in the US IT industry. If the Indian software engineers were to go back home, the U.S. IT industry would collapse the next morning.

This informant also admitted of the lobbying efforts that the Nasscom (an association of software companies in India) carries out in the U.S. to promote its transnational interests, bringing out a restive relationship between global capitalism and national states:

We have been working rather actively…in the USA. In fact, the recent H1B amendment that you hear about in which they announced an increase of 50,000 for the new quota for the H1B visas, starting on October 1 and lasting through September 30th 1999, we feel we acted as a major catalyst in driving that…Even much before that [we have been] lobbying with the Capitol Hill on various issues like Social Security to taxes and so on and so forth. Because we feel various kinds of taxes and various kinds of demands that are put forth by the revenue service department of US government are basically tantamount to double taxation on allowances given to the software engineers working in the USA[3].

This lobbying exemplifies an increasingly uneasy relationship between transnational capitalism and national bureaucracies about the status and flow of workers. This troubled relationship also expresses itself in the constant tug of war between corporations and Congress. While American corporations have been demanding unhindered inflow of foreign labor and less restrictions on their moving overseas and their activities there, Congress is always inclined to intensify border patrols, put up border fencing, impose restrictions on immigration for reasons that are both cultural and economic, and control the activities of American corporations abroad. Similarly, in the case of the Indian state, emigration of skilled labor has been a constant source of debate and consequences of "brain drain" for the domestic economy have always been a matter of concern. The feared hegemony of multinational corporations has been resisted during all decades since independence, reflected, for example, in such instances as the expulsion of Coca Cola in 1977 or the temporary cancellation of contract and bitter struggle with Enron Corporation in 1996.

Nation-state, Transnational Capitalism and Online Labor Flow

Transnational capitalism and the nation-state, however, seem to have negotiated a truce in the electronic space of online labor flows, which both allows unhampered movement of labor and skills and prevents alien cultural bodies from crossing national spaces. Increased globalization seems at once a process of increasing localization. The software firms are able to provide real labor at a global level; yet, both workers in India and corporations in the US remain on their local national turf. At this point, I must explain why I describe online practice in terms of labor flows, and not as movement of goods and services. Indeed, this practice—after passing through the conventional frames of economics and national bureaucracies—is variously understood as "trade" and "subcontracting" but never as "labor migration" which is still reserved for

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[3] The informant is referring to software professionals who come to the U.S. to work on-site.

physical migration of human bodies[4]. Such conventional frames, I argue, constitute the new in terms of the old. With the growth of information technologies and the resulting separation of work performance from the site, we need a different set of frames for understanding what is "labor" and how it "flows." In the context of programming labor, if the projects completed on-site—by physically bringing programmers from India to the US—are closely similar in nature to off-shore projects traveling on-line, we need to rethink the framing, and thus the constitution, of these practices in terms of "migration" and "trade."

Although the constitution of online labor flows as exports and imports—owing to national bureaucratic mechanisms—is understandable, I perceive three of the many reasons why online practice is basically a technique of labor supply. First, unlike other regular imports, online labor flows do not come under any import régime, as there are no taxes or tariffs imposed by U.S. government on them and no mechanisms to monitor billions of software lines whizzing across national borders at enormous speeds. Second, Indian software companies rarely specialize in tradable products and packages. They are mostly suppliers of high-skilled information labor either through body shopping—that is physical migration, or through virtual migration. The labor supplied through body shopping and online practices makes up 91.2 percent of the total earnings of these firms from foreign sources, while software products and packages constitute only 8.8 percent (Nasscom 1999). Third, there is not much discernible difference between onsite and online labor engagements. In fact, the decline in on-site engagements is directly linked to the rise of offshore engagements, bringing the two practices together as two alternate forms of labor supply. Many informants alluded to a gradual shift from body shopping to offshore project development, especially with the rise of reliable and fast communication links. The annual review of Nasscom connects visa restrictions with the accelerated growth of online offloading of work:

> With the proliferation of Software Technology Parks, service of high speed datacom provided by VSNL, liberalised economic policy, unnatural visa restrictions by the U.S. and some Western European countries, the component of off-shore development is expected to increase further.

> The degree of on-site development is still very high…but it is expected to decrease further in the coming years with improved datacommunication links. In 1988, the percentage of onsite development [through body shopping] was almost as high as 90% [which came down to 59 percent ten years later in 1998] (Nasscom 1999, p. 18).

On being asked why on-site services have not completely given way to on-line services, a Vice President of a software company in New Delhi replied to the author: "because the management [in U.S. corporations] is many times lazy in providing complete systems specifications." However, on further research, many other factors—regarding the necessity of at least limited on-site presence—emerged, including the time-zone difference, which both facilitates and hampers the reach and access of online labor. A more detailed description of on-line, offshore labor practice will further clarify the argument. One major software company in Bombay, which also has a small unit in the U.S., provides 24-hour information systems management for insurance claims processing to the American International Group, Inc. (AIG). One of the informants—who moved briefly from Bombay to North Carolina, while working for the same company—described this software work as follows:

> The Bombay team can directly access the clients mainframe. Usually what we have is maintenance project, and we support AIG's insurance business for 24 hours…There are different groups in AIG, and [we] support most of them…So, suppose someone is claiming [insurance] money from AIG due

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[4] The term "international telecommuting" could also be an appropriate term.

to some accident. He would go to AIG agents, [who] would enter the data on CICS [Customer Information Control System] screens, [inputs] like where this accident happened, what's the cause, and other details of the accident. And when this information is entered on CICS screens and the daytime is over in the USA, that information is captured and is written to a file, which is the input for our nightly batch processing. So, at 10:00 [PM] here, which will be around 8:30 in Bombay, in the morning, our daily batch cycles run. What it will do is the claims that are entered in the day (in the U.S. by AIG staff), whatever information is changed, like claim name is changed, address is changed, and other stuff--all this information will be processed in the nightly batch cycle in Bombay. We actually have about 60 jobs running one after the other, which update the table information [in] VB2 [Visual Basic 2] tables…

Time-zone difference was both an asset and a problem in this case. It was an asset because by the time office-work is finished in the U.S. and the night descends, software workers in India can start working on the backend tasks during their daytime. When the CICS system is not in use in the U.S., they can provide solutions and complete them online. When the U.S.-based AIG office opens in the morning, a lot of backend work has already been completed, allowing a virtual 24-hour office for the U.S. client. However, the time difference could also be a problem if the team in India fails to finish all the tasks during their daytime:

Some of the files, which we [the Bombay team and U.S. team] use, are common…so unless and until these files are closed, we cannot start our cycles. So the CICS has to be down [before the Bombay team can start working]. Around 10:00 PM [U.S. eastern time] the CICS is down, no information can be entered after that, so our batch cycle [in Bombay] can run. And if the batch cycle is not successfully finished within a certain time, or if it gets delayed due to some reason, then there will be a problem, because these people [in the U.S.] won't be able to enter the information [in the morning]. So, it's very critical to resolve everything [before they open their office in the U.S.].

As another example of online labor support, one of the programmers cited an instance when they supported Citibank operations:

Citibank had [changed] all their retail business; there were a lot of changes required in the programs already existing like day-to-day maintenance… [of] operations from the U.S. in the MIS department, which needs all the changes in software. There are always hundreds and hundreds of changes that are needed. One way is that they have their own people do it. The other way is how the work in their bank in Japan was done... There was a team of 3-4 people working in India, and there was a project manager onsite. I was the project manager, I would take work from the Japanese managers and I would send it offshore to India, and the Indian people will be working on their machines in a different environment. So any changes, any production problems, anything will immediately come to the people who were in India.

Describing the advantages of 24-hour time zone for software support to the companies in the U.S., he said:

Basically like it's night in the U.S. and it's early-morning here. In the [daytime] here there are a lot of things developed and given to them, and in the morning there, it's already there for them to test it, implement it. At the end of their day they just have to [compile] their problems and the changes they want us to do, and we can fix them in our normal working hours, fix them just in time, and it will be there next morning when they come to their office.

However, when there are problems and glitches, the time-zone difference hampers instant communication with the client that can resolve some of the problems, which is the reason why some Indian software companies establish a small unit in the U.S. for physical and temporal proximity. At times, some

companies open a branch in the same time zone outside the U.S., like the Caribbean, to avoid higher wage costs. As one informant, who joined J. P. Morgan through body shopping to work on-site, described the situation:

> J. P. Morgan had people work in India on projects. But…the time lag, time difference, [was a problem], they are sleeping and you are working, and you cannot really talk to them at the same time. It was [The work was done] through a [software] consulting company…[that] hired people in India, and gave them some work; they worked there, and sent back some code. But it didn't work. So instead, what the consulting company came up with was that they moved them to Barbados.

In addition to the constant support for information systems, including their enhancements, Indian software companies also work on independent software projects by cloning the client's systems environment—a unique feature of information technologies, and then redesigning and re-engineering the system. Such clients could be banks, airlines companies, manufacturing companies. As one of the software professionals in Noida, India, mentioned:

> We support your daily requirements for banking applications like daily branch opening, your account handling, your money transfers, everything, the routine tasks for which there's a need to build the software. It's very routine because most rules are documented. You just have to implement those business rules into software programs.[5]

Some of the projects involve a limited on-site presence of Indian software professionals who are flown—for a brief period—to the U.S. to develop an initial understanding of what the client exactly wants, as it is not always possible for the client to come up with complete project specifications and communicate them on-line. Similarly, at the end of the project, despite the online delivery of completed software projects, senior software engineers fly to the U.S. to see to the successful implementation of their projects. One of the project managers in New Delhi describes how they helped Gap develop a new information system to track their orders to vendor:

> What Gap does is like all their clothes are produced in the Third World, Latin America, India, Bangladesh and all these countries. They have vendors in all these places, so purchase orders are created between these vendors and Gap, and you want to purchase so many goods of a certain style, cut, of a certain size, and this order is sent out to these vendors. So, the process of automation is purchase order creation, and then getting the goods back and things like that. We were involved in the development activity. The Gap had given us a complete project. We cloned their environment on our own mainframe. We developed the project, we developed the complete software, and then I was in the U.S. implementing it and making changes.

The option of environment cloning, constant online monitoring across continents, and online shipping of programming work makes possible a new global labor regime that increasingly competes with the still strong international order of shipping the bodies, as in body shopping, across national boundaries. Physical immigration is not likely to end, especially in the sector of manual skills, necessary in farms, restaurants, and construction, but it does seem to have limited future in the high-tech sector, considering constant growth in offshore software development with faster communication links.

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[5] Many big companies in India, including U.S. subsidiaries, also carry out original research, apart from routine software development.

Conclusion

Since the 1980s, information technologies have triggered extensive transformations in production and work. These changes not only influence how work is organized within national boundaries; they also have global ramifications. On-line virtual labor across national spaces provides a new angle to explore this global shift and informs debates that transcend the site and nature of this specific work practice. With no ready grasp of the practice, online labor is too easily inserted into old schema and codes of understanding. It is ascribed either to the trade schema of "export/import" or to the organizational schema of "sub-contracting" and "outsourcing," missing the complex interconnections of new practices with a multiplicity of processes, such as labor migration and mechanisms of national bureaucracies. The metamorphosis of work into something that can be performed at a distance and delivered on-line is structurally dependent on distinctive features of information technologies. Using this understanding of the new technologies, this paper has sought to free the discussions of labor migration from the confines of the body. This enables us to see how the globalizing forces themselves can potentially produce localizing effects by helping confine laboring populations in their national territory. With newly gained flexibility in labor supply, contemporary capitalism seems to have resolved two major problems: First, corporations can avoid to a degree confrontation with the nation-state on the issue of alien immigration, for they can harness foreign labor online without a visa, bypassing the always-opposed nationalist politics of culture. In contrast to physical migration, where humans also come with the labor, demanding tolerance for cultural difference, education for their children, a possible long-term settlement, and general social security from the affluent society, virtual labor flows do not require alien humans to join the new nation. Second, the invisibility of virtual labor help U.S. corporations avoid to an extent the possible charge of preferring immigrants to citizens in terms of employment and job creation for the society in general. Future research on the topic may interrogate how the constant revolution in the instruments of production might necessitate a reconfiguration of existing relationships among states, corporate management and the global workforce.

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