

**INDUSTRY STUDIES ASSOCIATION
WORKING PAPER SERIES**

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2006
Industry Studies Association
Working Papers

WP-2006-02
<http://isapapers.pitt.edu/>

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* The authors acknowledge the support of Frank Mayadas and Gail Pesyna of the Alfred P. Sloan Foundation. They appreciate the helpful comments by the participants of the Manhattan India Investment Roundtable, Harry Rowen, John Zysman, and the anonymous reviewers. We thank the executives of the firms interviewed and, in alphabetical order, the Maharashtra Industrial Development Corporation, NASSCOM, and the Science and Technology Parks of India. The authors are solely responsible for the conclusions and opinions expressed in the paper.

ABSTRACT

The offshoring of services is rapidly growing in magnitude and scope. To understand this evolution, observation-based research is vital. In the last decade, services offshoring has rapidly expanded from software to any information technology-enabled business process. This paper draws upon two rounds of interviews with executives and managers in India and the case studies of Sloan Foundation-funded conference to explain the dynamics of offshoring to India, the largest recipient of offshored services, from the perspective of the firm, the industry, and the recipient nation. We show that the growth in offshoring was intimately linked to the prior development of India's software sector and an enabling regulatory and other institutional environment. Multinationals played a key role, although domestic firms were early adopters. The role of multinationals has deepened substantially moving from the large firm to include smaller firms, outsourcing specialists, and startups offering innovative new services. As this has happened, the value-addition and sophistication of the work done has increased. The most sophisticated work being done in India increasingly resembles the most sophisticated work being done anywhere else. Services exports required well-educated labor from the beginning, which is fundamentally different from the origins of manufactured goods exports from developing nations. However, a value-chain exists and it is possible that some lower-end services will relocate from India as the country moves up the value-chain. Finally, the speed at which services exports can grow in scale and scope is noteworthy and is occurring more quickly than was the case with manufacturing exports. This raises important issues for structural adjustment in developed countries. The

conclusion also considers the implications of the offshoring of services for developing nations and possible policy initiatives for developing nations interested in entering the ITES sector.

KEYWORDS: Offshoring, outsourcing, India

1. INTRODUCTION

The February 3, 2003 cover story of Business Week posed the ominous question for U.S. white-collar workers, “Is Your Job Next?” Motivating this alarming headline was the fact that the next great wave of globalization is in services. Notwithstanding the debate about the possible impact of offshoring services on developed nation growth rates, few believe that during the coming decades it will not significantly change the location of economic activity (see, for example, Hira and Hira 2005; Freeman 2005). Services offshoring challenges the comforting wisdom in developed nations that while manufacturing relocated to the developing world, the developed nations would simply shift to service activities. Services employment now makes up the preponderance of all developed nations’ employment. For example, according to the U.S. Bureau of Labor Statistics in the fourth quarter of 2003, 83 percent of the U.S. non-farm employment was in the services, and only 11 percent was in manufacturing (www.bls.gov/oes 2005). During the 1990s, more than 97 percent of the jobs added to U.S. payrolls were in services (Goodman and Steadman 2002: 3).

For developing nations with capable workforces services relocation offers enormous employment and entrepreneurial opportunities. The services potentially offshoreable from both manufacturing and non-manufacturing firms include in part or in their entirety staff functions including marketing, human resources, accounting, facilities management, purchasing, finance, customer relationship management and R&D (which, strictly speaking, is not considered a service). In non-manufacturing firms such as finance, insurance and retail, the “line” processes are services and many of them are offshoreable.

The potential numbers of jobs that can be offshored is at this moment unknown, but is likely enormous. Various estimates have been advanced. For example, Jensen and Kletzer (2005) using a measurement of the proximity of service workers to their customers as a proxy estimated that theoretically 70 percent of professional and business services employment could be offshored. In another study, Batt (2005: i) estimates that call centers (all of which are potentially offshoreable) employ as much as 3 percent of the U.S. workforce. Examining specific industries and occupations, the consulting firm McKinsey (2005) estimated that 42 percent of developed nation employment in automotive engineering and R&D, 60 to 78 percent of engineering and associated middle-level managerial positions in the packaged software industry, 47 to 56 percent of the software and hardware engineering and associated middle-level management jobs in IT services, and 45 to 55 percent of the analysts working on software/IT architecture and market research could be offshored. In other words, millions of jobs are potentially offshoreable.

No doubt, there are limits to offshoring. Many services are what Reich (1990) called in-person services and as such they are not offshoreable. And many services cannot be offshored because of lack of offshore expertise, legal and social obstacles, or the importance of onsite teamwork. For example, the design of a new mortgage product would be difficult to undertake remotely due to the rapidly changing nature of market and legal conditions and local consumer preferences. However, once the product has been conceptualized and market tested, the work associated with delivery of the mortgage product might be offshored. Similarly, in semiconductor design, the final stage of design integration (“tape out”) usually requires the design team to be in one location (Khare 2006). Nevertheless, what were formerly non-

offshoreable services may, through operational changes in business models, consumer preferences, and/or technology may be made amenable to offshoring. Examples of these types of changes can be seen in the emergence of telemedicine and patent preparation.

This paper utilizes the development of service offshoring fulfillment in India to explain the dynamics of offshoring from the perspective of the firm, the industry and the recipient nation. To accomplish this goal, we explain the Indian industry's origins and growth, sources of entrepreneurship, corporate structure, the role of multinationals and the role of transformative technologies. India is chosen as a case study because it is far and away the leading recipient of offshored service jobs. The research for the Indian case study included three trips to India. The first research trip to Mumbai, New Delhi, and Bangalore in March/April 2003 in which managers at 46 firms were interviewed. The second research trip to Mumbai, New Delhi, and Bangalore in March/April 2004 when managers at 24 firms were interviewed. The third research trip to India was in April 2005 when managers at 25 firms were interviewed. In addition, at a Sloan Foundation-sponsored conference at Stanford University twelve case studies by industry participants were presented, and they are drawn upon for this paper. Finally, an extensive review of writings from the popular press was used. The importance of the industry interviews was that the repeated visits allowed us to track the changes that demonstrated the dynamism and increasing capabilities developing in India.

The growth in offshoring is intimately linked to the prior development of India's software sector and an enabling regulatory and other institutional environment. Multinationals played the key role, although domestic firms were early adopters. Now, offshoring as a strategy is diffusing from the largest firms to smaller firms, outsourcing specialists, and innovative startups. Concurrently, the value-addition and sophistication of the work done has increased. The most sophisticated work being done in India today resembles the most sophisticated work

being done in developed nations. The conclusion of this analysis is that India has developed an environment and capabilities which are likely to lead a major shift in the location of service work.

To comprehend the expansion of service offshoring it is necessary to analyze the growth of the business. Services exports require a well-educated labor force; this differs substantially from labor requirements for exporting manufactured goods from developing nations. These findings have two implications. A significant dimension of services relocation that is different from the relocation of manufacturing capacity to developing nations is the speed with which it can occur. Chinese growth rates in exports have recently ranged between 18 percent during the 1995-2005 period and 25% during the 2000-2005 period; whereas Indian service exports averaged 35 percent during 2000 and 2005 (World Bank,2005 and Nasscom, 2005) . While relatively low capital requirements for establishing a services facility are one reason for the difference, the main reason is that services relocation has been accompanied by considerable re-engineering and organizational experimentation. Further, services requires an established education and training infrastructure to provide a pool of well-educated labor. Such labor, we argue, possesses portable skills across firms that leads to quick learning. This, too, adds to the speed with which new services can be relocated.

Second, it is possible that some lower-end services will relocate from India due to other nations entering the market with different competitive advantages. Finally, we show that the Indian experience provides insight into the potential for other developing nations including China, the Philippines, those in Eastern Europe, and, quite possibly, Mexico and Brazil to participate in the global redistribution of service employment.

The paper is organized as follows. Section 2 provides the context of technological change and other aspects of business continuity that made service offshoring feasible. Section 3 takes the perspective of the firm and traces the evolution of offshoring, beginning with simple operations based on labor cost arbitrage to the emergence of organizations based on the exploitation of economies of scale and scope. The next stage was a shift to reengineering operations for greater efficiency that facilitated learning and most recently, provided services that are as sophisticated as those undertaken in developed nations. Here we also discuss the strategic concerns of developed country firms when they offshore. Section 4 discusses the organizational forms and ownership structures that evolved with offshoring and relates them to the kinds of work done. In conclusion we discuss the implication of service offshoring for developing and developed nations.

2. TECHNOLOGICAL CHANGE, BUSINESS CONTINUITY AND SERVICES RELOCATION

Until recently, services globalization meant the provision of services by MNC service providers operating in many nations. The global service providers encompassed not only banks, insurance, consulting, and technology firms, but also included law firms, accountants, executive search firms, and the like. The offshore operations of these firms performed activities for the local market and this remains the preponderant model of service globalization (Borga, 2005). In this case, globalization was an outcome of the need to be embedded in the local market to acquire information and support local customers. This created only a rudimentary division of labor. For example, Goldman Sachs located its operations in Japan to access the local market for information and customers. In this model, Japan was not part of a global division of labor. Services had not been decomposed into separable and relocatable processes of which Japan was only one node in a global value

chain (Gereffi et al. 2005). In this model, labor costs in a particular nation were not a critical factor in deciding where to locate, and there were few opportunities for the host nation to benefit significantly by learning from the subsidiary.

The spatial relocation of services based on geographical repositioning of components of the services value chain occurred first within the developed nations (Richardson et al. 2000). For example in the 1960s, to minimize labor costs firms began relocating back office business processes from their headquarters in large cities to smaller Midwestern towns where accents were neutral, education was adequate, unionization rates were low, wages were lower, and, at that time, the labor was relatively more reliable. Though there were significant cost savings, factors limiting the scale of operations of these facilities included the shallowness of non-metropolitan labor markets especially the paucity of highly educated employees.

Despite the sectoral precedents, however, the scope for transferring service provision offshore was unanticipated. The most notable precedent emerged in the early 1970s as some software programming was moved to India, or, more properly, in the initial phase Indian engineers were moved to work sites in the developed nations (Arora and Athreye 2002; D'Costa 2003; Heeks 1996; Schware 1987). Contemporaneously, Ireland and Israel were also beneficiaries of software offshoring (O'Riain 2004; Sands 2005; De Fontenay, and Carmel 2004; Breznitz 2005).

Later in the 1980s, there were some initial forays abroad as some credit card processing and call center activity was relocated to Latin and Central America and the Caribbean (Posthuma 1987). These developments established the principle that offshore relocation of a range of business processes was feasible and cost-effective.

Nearly simultaneously, the reengineering movement that swept management in the 1990s focused attention on the savings that could be achieved by reorganization. One part of this reengineering was to examine, decompose, and standardize the activities necessary to complete a process (Hammer and Champy 1993; Cole 1994). Through the standardization process, “pinch points” facilitating handoffs were established, and these facilitated the separation of the work process either geographically, organizationally, or both (Baldwin and Clark 2000; Gereffi et al. 2005; Jacobides and Winter 2005). Reengineering was often accompanied by a digitization of certain activities and even an entire process. Once reengineered with clarified pinch points, managers could more accurately calculate the most cost-effective way to complete each activity.

The creation of pinch points was synchronic and synergistic with a movement by large firms to industry-standard software platforms. These global standard platforms encouraged software-specific investment by the workforce, rather than firm-specific investment that had been the pattern for the earlier idiosyncratic legacy systems. The result was that skills became portable between firms and worth investing in not only in developed nations, but also developing nations (on asset specificity see, Coase 1937; Williamson 1975; 1985). The acceptance of standard software packages had an effect similar to the one that the earlier adoption of Unix and the workstation had on the outsourcing and, later, offshoring of software services in the 1980s (Steinmueller, 1996; Dossani, 2006). The result was the emergence of a trained work force in developing nations that made offshoring more attractive to firms as they did not need to invest in training the work force. In effect, a global employment pool was created.

The current ability to access this emerging global pool is rooted in technological advances. Engineers and corporate visionaries in Silicon Valley and a few other places in the world were designing the “office of the future” within which paper would be banished, replaced by digitized images on a screen. Though paper has not been banished, increasingly much of the information encoded on paper has been digitized. Digitization combined with rapidly declining costs of transmitting data to erode the costs of distance.¹ The Internet Bubble of the 1990s prompted telecommunications carriers to install enormous amounts of new international fiber optic cable capacity leading to a glut.

The result was that, in cost terms, formerly distant locations such as India became increasingly proximate, even as many of their other characteristics particularly labor costs remain “distant”. This provided the opportunity for organizations capable of spanning the physical distances and capable of mobilizing equivalent (or at least similar) labor power to benefit from a labor-cost arbitrage opportunity.

Technology was necessary, but not sufficient, to enable firms to move their service activities offshore. It was equally important that business decision-makers be persuaded that offshoring was an acceptable strategy or “legitimate.” This legitimization process was partially accomplished by proving there were appropriate levels of security and sufficient assurances of business continuity. These included various international certifications such as International Standards Organization (ISO) certifications including ISO 9001 and 14001, the Carnegie Mellon software and other certification levels, and the adoption of “six sigma” processes (Guler et al. 2002; Neumayer and Perkins 2004). Indian firms as well as multinational subsidiaries adhered to these as “proof” they were global class – over half the SEI-CMM level 5

¹ The decrease in rates was facilitated by technological change, but also by U.S. government pressures on other countries to decrease their fees for connecting international calls (Cowhey 1998; Melody 2000).

companies are based in India (Naidu 2006). The point was to create the perception that moving one's service operations to India was not "unusual" or "risky," but rather was part of a normal business model. The demonstrated previous success in offshore software operations of MNC pioneers and the Indian software outsourcing firms also provided legitimacy for the relocation of services.

Beginning in 1993, elite transnational firms such as General Electric, Citicorp, HSBC, Texas Instruments, Motorola, Hewlett Packard, and American Express began offshoring business services to India. The opportunity to sell services quickly attracted consulting firms such as McKinsey, the Gartner Group, and other consulting firms touting offshoring through various reports and selling their services simultaneously. The fact that the early Indian pioneers were elite firms was further confirmation of the wisdom of offshoring to India. The final factor in legitimating offshoring were the evangelists such as General Electric's Jack Welch and later Dell Computer's Michael Dell, and Hewlett Packard's Carly Fiorina.

The offshoring of services evolved from being technically impossible, and thus not even considered, to a normal business decision. The next section discusses how the process began and evolved as a corporate activity.

3. OFFSHORING FROM THE PERSPECTIVE OF THE FIRM

In choosing which processes to relocate, often the most routinized activities are offshored first because of the lower risks of failure. In contrast to much of the literature on offshoring that has a static perspective on offshoring, we accept Bruce Kogut's (2004) contention that the act of establishing an operation in a new location will necessarily ignite learning in the location and by the firm. This learning may be trivial

or significant depending on the existing knowledge present in the location, the level of sophistication of the new operation, and the entrepreneurial disposition and attitudes toward learning of the local managers. In every case, there will be at least some learning. In certain cases, a powerful virtuous circle of learning is triggered that increases the scale and scope of capabilities in the new location (Kogut and Zander 1992). This learning can be especially dramatic if a large number of operations with similar characteristics are established in a location and mutually reinforce locational learning. In such cases, higher valued-added activities may be attracted rapidly. The case of a major U.S. technology firm's Indian operations discussed below is a demonstration of this. This major firm established its Indian subsidiary in Gurgaon where there were already numerous MNCs with similar facilities. This allowed the firm to draw upon the existing infrastructure for employees, legal and executive search services, and the necessary infrastructure in telecommunications. Not only did the operations experience interval learning, even if it was only the transfer of work formerly done in the developed nations, but also the environment evolved to support the new business operations.

The conventional wisdom is that routinized, low value-added jobs such as telephone answering, medical transcription, claims processing, and data-entry types of activities are the jobs at risk (Levy and Murnane 2004). Our research, as shown by Figure One for a major U.S. technology firm indicates that this conclusion is too limited.² In the last two years again, as illustrated in Figure Two, there has been a

²In 2003, 2004, and 2005, the authors conducted in-person interviews with executives in both Indian and foreign firms operating in India. These discussions contained both open-ended questions and a short formal questionnaire aimed at collecting basic information regarding growth and employment. The open-ended questionnaires aimed at understanding the evolutionary paths of the firms and other questions regarding the evolution and

widespread acceleration in offshoring far more skilled positions in R&D, design, and sophisticated mathematics-based financial and actuarial analysis requiring post-graduate degrees to name only a few. Hence, services offshoring will not only affect routine work, but will affect many formerly protected highly skilled and well compensated jobs – the large bulk of which are concentrated in the developed nations (Freeman 2005). At this time, even U.S. venture capital-financed, high-technology startups are establishing offshore subsidiaries to conduct high-end semiconductor design work and software algorithm development (Dixit 2005; Shah 2005).

FIGURE ONE ABOUT HERE

The single greatest motivation for considering India for offshoring from a developed nation is lower labor costs. Interestingly, the one occupation for which this generalization may not be true is software programmers where there were labor shortages globally during the Internet Bubble in the late 1990s.³ In general, though, the wage differences are dramatic. For example, in 2003 a junior accountant at a large U.S. firm with less than one year experience would earn between \$36,000-42,000 per year (AICPA 2004), and approximately 10 percent more if they were a certified public accountant. In India, a junior accountant would typically earn less than \$9,000 per year. The Indian wage rate for entry-level call center employees in metro areas is \$2,400 a year. For a graduate engineer wages are approximately \$7,000 per year. In 2002 the average salary was \$13,226 for an MBA graduating from India's prestigious Indian Institutes of Management (Rai 2003).

changes in the industry. The interviews were conducted on-site at firms in Mumbai, New Delhi, and Bangalore. In 2003 40 firms were interviewed, in 2004, 35 firms and in 2005 35 firms. The perspectives developed in this paper owe much to these discussions.

³ For the argument that there is or, at least, was a shortage, see Barr and Tessler (1997). For the counter-argument, see Matloff (1998).

Savings in indirect labor costs are also significant. The service facilities in developing nations like India are located in cities with populations in excess of one million with regional labor pools having large numbers of college educated potential employees. This simplifies the recruitment of large numbers of employees in a relatively short time. This is important to manage growth without adding new branches. Further, in many low-end services such as call-centers, the presence of a large labor pool is important for business continuity in the face of high attrition. Another economy arises from being able to manage variable and peak loads better. These larger operations can buffer the effects of absenteeism and capture efficiencies from a greater division of labor. In many developed nations, decades of downsizing in response to the use of IT in service processes led to relatively small workforces, leaving managers and other supervisory staff with excess capacity. Relocating the work of many branch operations into a consolidated operation located at a single facility can save significantly on managerial resources.

The infrastructural costs of siting an operation in a developing nation such as India differ from the costs in developed nations. For example, telecommunications and other infrastructure-related costs are often higher; while others, such as rent and taxes, are often lower. For the foreseeable future, as **Table Two**, which is adapted from Nasscom (2003: 68), indicates, lower labor costs provide India with a durable cost advantage, even if labor costs rise substantially. The total expected savings on the activity being relocated to India is at least 40 percent (Nasscom 2004, p 64). Recently, rising Indian labor costs have been partially offset by declining telecom costs and rising productivity. Other obstacles, such as equipment and software service may have been issues, but, during the last decade, major vendors have established customer support operations in India, thus maintenance and repair are no longer issues. Telecommunications capacity was a problem in the 1990s, but

neither capacity nor quality are problems in 2005. The difficult remaining infrastructural issues are public goods especially the utility and transportation infrastructures. The second-best corporate response has been to install multiple redundant back-up power generation and hire fleets of private buses to ferry employees to work. These do add overhead costs, but appears to be manageable.⁴

TABLE TWO ABOUT HERE

The reengineering that occurs as part of a transfer process can provide significant savings. These savings result from the study and planning necessary to transfer an activity. In the process of study, often aspects of the current methodology for discharging an activity are discovered that do not add value. During the transfer process, it is easier to reform or abandon inefficient practices than it would be at an existing facility where they have become a “natural” part of the daily routine (see, for example, Adler et al.(eds.) 1999). These reforms can be implemented without the resistance often encountered when reorganizing established work patterns. The workers in the new location experience the reorganization as a fait accompli. Though difficult to quantify, the savings that can be achieved through this transfer process can be significant.⁵ Internal documents from the Major Technology Firm shows headcount savings of 37 percent, implying larger cost savings overall (See **Table Three**).

TABLE THREE ABOUT HERE

⁴ From our interviews, we estimate transportation costs per employee to be approximately \$50 per month in March 2005. The establishment of facilities in other countries also is motivated by the exigencies of risk spreading and having 24/7 coverage.

Set against these benefits in terms of cost and timeliness, there are significant strategic concerns. These concerns are usually not so pressing in the more highly commoditized and well-understood service activities. Given the novelty of service offshoring, even activities that might be considered routine in the developed country can be subject to quality slippages in the offshore destination due to unexpected difficulties such as retaining staff, cultural misunderstandings, language difficulties, or employee dissatisfaction in the home country.

For activities having higher knowledge and creative inputs there may be concerns about a decline in service quality, the loss of intellectual property protection, and/or an inability to control an offshore operation.⁶ These problems are most likely to arise for activities that have a large tacit component or where intimate market knowledge is necessary. The literature suggests that activities such as design and marketing are likely to be the most difficult to transfer. However, we will provide evidence that supposedly tacit activities such as R&D are already being transferred.

MNCs may also be concerned about a loss of competencies in a certain location that would be costly (or even impossible) to reacquire in that location. One way MNCs mitigate these concerns is by developing a hybrid strategy whereby the activity is shared between some domestic capacity, “near-shore” capacity in somewhat lower-cost labor nations such as Canada for the U.S. or Eastern Europe for Western Europe, and “offshore” locations such as China, India, and the Philippines.

⁵ Interlocutors tended to classify savings of three kinds and amounts: direct labor cost savings, ranging from 20-50%, savings from consolidating processes and benefiting from scale economies and other effects of reengineering, ranging from 20-30%, and automating the process, ranging from 20-30%. Some firms, such as HP, claimed aggregate cost savings of over 70% as a result of applying all three factors (Personal Interview 2003)

⁶ These concerns may be even more acute in cases where the operation is not only offshored but also outsourced.

The decision to offshore an activity is complicated. Transferring work is difficult, in part because often workers in the developed nations are hostile to the personnel from the developing nations dispatched to learn their functions prior to transfer. Conversely, in the developing nation it may be difficult to train the workers to undertake the work for linguistic, cultural, or social reasons. And yet, increasing numbers of firms are deciding that their competitive environment compels them to experiment with offshoring. Whereas only five years ago offshoring services was not a high priority among most Fortune 500 firms, by 2003 it had become almost a mantra among corporate executives. In less than six years, services offshoring has evolved from an exotic and risky strategy to a routine business decision. The next section discusses the organizational forms and ownership structures that evolved with offshoring and relates them to the kinds of work done.

4. THE INDUSTRIAL STRUCTURE OF THE INDIAN INDUSTRY⁷

The evolving industrial structure for the future location of work can best be understood by examining the types of firms involved in offshoring.⁸ The number, size, and diversity of organizations offshoring service processes is great. The diversity can be attributed to several factors. First, an enormous variety of services can be offshored. Second, a new market opportunity encourages organizational experimentation

⁷ This section is a significantly revised from our earlier article Dossani and Kenney (2003).

and attracts a wide variety of organizations (Schumpeter 1939). For example, organizations may begin by offshoring into their own subsidiaries work that had been outsourced within a developed nation. Once offshoring is established as a 'normal' business practice, the firm may outsource it within the developing country to further cut costs. Assuming an acceptable result with earlier initiatives, work the firm considers as core to its functioning may be offshored but will not be outsourced. Indian outsourcers still focus on more routinized work relative to multinationals, although this may be changing as they secure more sophisticated processes.

There are two important dimensions for categorizing the ownership of firms in the ITES sector. The first dimension is ownership, which we partition into Indian or foreign ownership.⁹ The second dimension is whether it is a subsidiary undertaking only internal work or whether it is a service provider. The two-by-two **Figure Two** categorizes the organizational forms we believe are most significant. Quadrant One is the foreign subsidiaries that work exclusively for their parent firm. These include the most sophisticated service offshored work. Quadrant Two contains the MNC outsourcing firms, and these are among the largest MNC operations in India. For example in 2005 IBM employed in excess of 35,000 in India. The final category contains the various Indian firms providing offshore services. The three organizational forms in Quadrant Three indicate the diverse Indian responses to the business opportunity. As services offshoring to India is less than a decade old, it is hazardous to predict whether a single organizational form will become dominant. Since the service function is so

⁸ Corporations are the predominant organizations offshoring, but the World Bank now does all of its back office work in a facility that they own and operate in Chennai, India.

⁹ Another category is possible, namely firms established by non-resident Indians. These firms, some of which have become quite large, we include these firms in the other categories.

broad and crosses so many industry boundaries, there is reason to believe that services offshoring will never become a single industry. For example, niches such as medical transcription, geographical information system (GIS) data entry, and document conversion are all segments in different value chains. Also, it is likely that the MNC subsidiaries will never outsource functions such as is the case for Adobe's Indian subsidiary's work developing of new software programs. These are part of Adobe's core activities. Put differently, the variety and complex role of services in organizations suggests that many organizational forms will develop to facilitate offshoring.

FIGURE TWO ABOUT HERE

Unlike earlier offshoring of software programming to India, MNC subsidiaries led the way in the establishment of the non-software service offshoring. They continue to be the largest and, even more important, the most sophisticated operations. This contrasts with software outsourcing, where the Indian firms are dominant in the Indian market in terms of the numbers of employees and earnings, through MNC service providers such as IBM and Accenture are expanding rapidly. In services offshoring the MNC subsidiaries are larger and have retained the highest value-added activities.

(a) MNC subsidiaries

The MNC subsidiaries include organizations from a wide variety of industries, and many have grown to be quite large. For example, in 2005 HSBC employed in excess of 10,000 in India. The earliest service offshoring operations were initiated by MNCs that had existing software development facilities in India, and simply various services to their existing operations. The first back office service operation in

India was established by American Express in 1993. In 1996, British Airways established a back-office operation in India. In 1997, General Electric initiated BP operations in India. By November 2003, General Electric was the largest service subsidiary employing over 12,000 Indians.

The rush of MNCs did not begin until 2000, as firms including Hewlett Packard, HSBC, and JP Morgan Chase leveraged their domestic Indian operations to establish ITES subsidiaries. Roughly contemporaneously, MNCs such as Dell Computers, AOL, and SAP that previously had had no Indian operations established operations. These newcomers expanded rapidly. For example, Dell launched its Indian call center operation in June 2001. By April 2005 it had grown to a total of 10,000 employees.

A subsidiary offers many advantages, the most significant of which is the control provided by a wholly owned subsidiary. The firm controls the labor process, and thus is not subject to the decisions made by a third party firm. It also provides greater control over sensitive information and business processes. For a large MNC, it is possible to guarantee high utilization rates of the overseas facility because the firm can assign capacity. In cases where the profit margin is large operating a subsidiary means the return need not be shared with another organization.

Often as the offshore operation matures, increasingly high value-added activities can be transferred. For example, **Figure One** illustrates the maturation of Major Technology Firm's Indian operations in terms of the types of processes it was undertaking. The operation began in 2001 with simple activities such as data entry. Only four years later, the Indian operation had expanded both the number of activities offshored and their complexity. After only a single year of operation, Major Technology Firm India was doing analytical work such as

determining options for resolving problems with vendor payables. In the next year, it began risk management operations, such as resolving outstanding payable. Most startling was the rapidity with which the Major Technology Firm facility evolved, both in functions and employment (Dossani and Manwani 2005).

R&D operations is another area where India (and China) are benefiting significantly from offshoring (for China, see Zedtwitz 2004). MNCs are also offshoring R&D operations. General Electric employs over 2,200 scientists and engineers in Bangalore to do research in areas “like Electromagnetic Analytics, Composite Material Design, Color Technology, Additive Technology, Non-Destructive Evaluation, Corrosion Technology, MEMS, Molecular Modeling, Power Electronics, Analysis Technologies, Computational Fluid Dynamics and Engineering Analysis (General Electric 2005).” Intel had a design project for its next-generation Xeon processors in Bangalore, though it was abruptly cancelled in November 2005 (Vance 2005).

One example of the sophistication of the R&D underway in India is the General Motors (GM) Laboratory in Bangalore, which is meant to undertake R&D and design for the global market, July 2005, employed approximately 240 professionals but announced plans to grow to 400. In July 2005, the laboratory sought individuals with master’s degrees or, preferably, Ph.D.s in aerospace, computer, industrial, mechanical, and software engineering and computer and materials science. In the materials laboratory, GM was searching for master and Ph.D. holders in metallurgy, polymer science, materials science, materials processing, and math-based analysis of materials. In the material process modeling group, there was ongoing research in validating microstructural models, designing high-performance materials, and

molecular modeling of nanocomposite/TPO exfoliation and fuel cell membranes (General Motors 2005). Though these are only anecdotes, they are evidence that the MNCs are now doing fairly sophisticated R&D in India.

Another interesting development is that MNCs are giving their global responsibility for certain processes. In larger firms, this can mean that the Indian subsidiary is charged with managing overseas facilities also. The Indian center has responsibility for enforcing standard operating practices globally. The establishment of corporate global centers of excellence in India entails a substantial transfer of know-how and responsibility to the Indian operation. Moreover, assigning the global mandate to India suggests that firms are confident that their Indian operations are well-managed.

An example of this is Broadcom's Bangalore operations, that is one of only three worldwide that manage the entire process of semiconductor design (San Jose and Irvine in California are the other two). This involves managing the operations of teams in various locations in the United States, Singapore and Israel. The Bangalore facility has been awarded 10 US patents since 2003 and expects an additional 25 patents annually from 2006 (Khare, 2006).

At some subsidiaries capabilities have evolved to the point at which the MNC believes that it can become a merchant service provider to third parties. Already, General Electric has spun off its business process subsidiary as an independent firm (Genpact). Hewlett Packard has begun using its Indian operations as integral components of its global service operations. In an increasing number of cases, MNCs are purchasing Indian firms. These moves provide an indication of the maturity of the Indian subsidiaries.

The expansion of the existing MNC subsidiaries and the entry of new firms has been rapid. For certain activities and processes the Indian subsidiary has become a global center of excellence. A number of firms have established R& D facilities that are integral components of their global operations. We expect the incumbent subsidiaries will continue to expand even as those MNCs that have not yet begun offshoring are likely to begin soon. In conjunction with the increasing number of subsidiaries, we expect their sophistication to also increase. These MNC subsidiaries share many commonalities with the MNC outsource service providers such as IBM Global Services, HP, Accenture, and Siemens Business Services and along with them are likely to develop the largest operations in terms of employment and host the most sophisticated and highest value-added activities.

(b) Multinational Outsourcing Service Providers

Services outsourcing has expanded rapidly during the last decade. More recently, the decision to outsource often has coincided with a decision to offshore. The MNC outsourcing service providers include data systems firms such as EDS, HP, IBM, and Keane; payroll and accounting processors such as ADP and EDS; call center and customer relationship managers such as Convergys, Sitel, and Sykes; large consulting firms such as Accenture, Siemens Business Services, and many others. Many outsourcers provide not only business services, but also software services as part of a full complement of services. Globalization is not new for these firms. Not only do the larger ones provide services internationally, many of them had international operations prior to the current offshoring phase.

The MNC outsourcers only seriously expanded their developing nation service provision centers after 2000, largely in response to competition from the Indian independents and demands for lower costs from their customers. These MNC outsourcers have operations in a number of lower cost nations so they can provide near-shore and offshore support. The MNC outsourcers are formidable firms having long-established customers and enormous domain knowledge, thereby permitting them to scale-up their Indian operations extremely rapidly.

IBM's growth has been the most dramatic. In 1978 IBM withdrew from India due to a dispute with the Indian government, and only returned in 1992. It was only in the late 1990s, however that the Indian operations began a major expansion. In 2005, through organic growth and acquisition, IBM India had increased its employment to 38,000 in 2005 (Subramanyam 2005), which was more than 10 percent of its global workforce. Other firms have not been far behind. For example, in late 2001 Convergys, one of the largest call center service providers in the world, opened its first Indian operation in New Delhi. By April 2003 Convergys had more than 3,000 Indian employees. By February 2005, Convergys employed more than 10,000 Indians (Business Courier 2005). The employment growth for many of these firms was vertiginous and represented an enormous investment.

The MNC outsourcers have significant advantages derived from their experience, long-term customer relationships, and ability to provide global solutions to their customers. For the MNC outsourcers having developing country subsidiaries is necessary to respond to the continuous cost and delivery pressures they face. Their experience, existing customers, and enormous resources has allowed them to rapidly expand their offshore operations.

(c) MNC Specialists

In all developed economies there are a wide variety of processes that, at a minimum, have certain activities that can be offshored. Examples of the specialty work being offshored include medical transcription, tax preparation, patent filing preparation, English-language text editing, map digitization, cartoon animation, document entry and conversion, architectural and engineering drawing, and database creation, to name the most salient. This category is so diverse that the effects of these transfers will be dispersed and little noticed. Often, the firms offshoring these processes are medium-sized and some have never operated abroad. And yet, cumulative employment transfer will be substantial.

One important field where offshoring is expanding rapidly is the conversion of written information into a digital format. Organizations around the world want to digitize blueprints, maps of water, sewage, and power infrastructure systems, aerial photographs, newspaper and magazine archives, and many other items within information encoded on paper. For example, the Danish mapping firm, Kampsax, moved all of its production operations from Denmark to India. Only headquarters, some technical functions, and sales and marketing remain in Denmark (Personal interview 2005). For Kampsax, the appeal of India is that the initial digitization is labor-intensive and expensive, so without access to low-cost labor the inputting process is often prohibitive. After the digitization of the data in India, it can be utilized anywhere in the world including India. The common wisdom is that this higher value added analysis and manipulation of such digitized data will be undertaken in the developed nations. A question for developing nations such as India is whether they can begin to do the analysis.

Medical transcription is another specialty for which there is much offshoring potential. In 2002 there were approximately 101,000 medical transcriptionists scattered around the U.S. (U.S. Bureau of Labor Statistics 2005). Recently, a number of U.S. firms such as Healthscribe¹⁰ have been consolidating transcription services, roughly in parallel with the consolidation of the health care industry. The consolidators are establishing offshore facilities where transcription can be done at a lower cost and with comparable quality. The variety of activities that can be offshored partially or wholly suggest the scale and scope of the transformation of the geography where service work will be done.

Even small U.S. firms may benefit from offshoring. For example, a small Davis, California structural engineering firm with a total employment of 27 professionals subcontracts a small Indian firm for the services of five structural engineers and was considering contracting for five more engineers in Vietnam (Harris 2005). Our research suggests that the commonly held assumption that only larger firms will offshore is false. As a result, offshoring may become far more pervasive than commonly assumed.

The sheer diversity of service activities being offshored mean that almost any developing nation having well-trained but under-utilized human resources can participate in the emerging global service economy. The wide diversity potentially offshoreable, means that policy-makers should be able to fashion credible incentives to attract specific types of work formerly isolated from global competition that may be integrated into the global economy. That may mesh well with their skill sets in terms of languages, domain expertise, etc.

¹⁰ In October 2005 Healthscribe was purchased by the second largest medical transcription firm in the U.S., Spheris (PRNewswire 2004).

(d) U.S. High-Technology Startups

Traditionally, in their early stages high-technology startups grew in a single location, and only began offshoring as they matured. At this time, there are no comprehensive studies of offshoring by startups, only anecdotal examples (see, for example, Dixit 2005; Sierra Atlantic 2005; Shah 2005; e4e 2005). From these case studies, we have distilled two models for using offshore resources. The first model is offshoring as a supplement to onshore operations. In this case, early in their life cycle startups decide due to the need to lower cost and/or speed product development or product extension to establish an offshore facility. In the second model, an offshore facility is an integral part of the business model in which low-cost offshore engineers are leveraged to make the business possible. In either model, establishing an offshore facility is either necessary or, at least, beneficial.

This pattern of offshoring was prompted by the collapse of the dot.com bubble, when startups found themselves in straitened financial circumstances and had to lower their costs. For example, Netscaler was founded in 1998 to redesign a specific piece of infrastructure used in regulating Internet traffic flow. After Netscaler developed its first product it needed to add other features to attract customers unsure about switching to its offering. Because Netscaler was constrained financially and needed to cut costs, in 2001 it hired an Indian firm known as NodeInfoTech to help develop the new functionality.

The successful outsourcing project convinced Netscaler to establish Netscaler India. To staff the new operation, Netscaler hired many of the developers from NodeInfoTech (Jagdeesh 2005; Tillman and Blasgen 2005). In 2004 Netscaler India employed approximately 60

engineers to develop features and grew to 200 total employees in 2005 (Hindu Business Line 2004), when it was purchased by Citrix Systems for \$300 million.

The reason given by Netscaler for forming a subsidiary rather than outsourcing was to increase the number and sophistication of projects done in India and encourage tighter engineering integration (Jagdeesh 2005). After its initial foray into India, Netscaler offshored high value work to its subsidiary, and outsourced some lower-level engineering support to vendors. One advantage Netscaler received from having Indian and US internal engineering teams was that it was able to provide all levels of support 24 hours a day. Since it now had engineering teams in the U.S. and India, it decided to hire a technical writer to provide software documentation in India to complement the one in the U.S.

Because Netscaler was purchased by Citrix Systems in 2005, it is difficult to say what the ultimate steady state of balance between employment in the Indian subsidiary and the U.S. headquarters would have been. Netscaler demonstrates that a Silicon Valley startup can successfully establish, operate, and expand a subsidiary in India. Though it is difficult to generalize, an increasing number of startups are establishing Indian subsidiaries to supplement their U.S. operations. This suggests that future employment growth will, at a minimum, be divided between the headquarters and a subsidiary.

The second business model is a firm that has its headquarters, marketing, and sales in the U.S., but the remainder of the firm is located offshore. An example is Hellosoft, which was established in Silicon Valley in 2000 and funded by U.S., Taiwanese, and Indian venture capitalists. Hellosoft provides high-performance communications intellectual property for VoIP and wireless devices using low-cost Indian

engineers. All of its R&D is undertaken in a subsidiary located in Hyderabad, India that employs over 100 digital signal-processing engineers (Hellosoft 2005). The Hyderabad center develops software for advanced cell phones and networking technologies. Marketing and sales operate from its San Jose headquarters.

The Hellosoft business model is predicated upon leveraging low-cost Indian engineering talent with the U.S. headquarters interfacing with the larger Silicon Valley environment and customers. Should Hellosoft be successful nearly all of its expansion will occur in India. The beneficiaries of Hellosoft's success will be venture capital firms that will garner significant capital gains, the U.S. management team reaping the capital gains, the Silicon Valley service firms that assisted in the establishment of the firm, and consumers who presumably would be able to purchase lower cost products. Were this model to become dominant, then Silicon Valley would shift away from being the technology development center and towards being a center for organizing and funding deals, sales, and marketing.

An increasing number of US technology startups are utilizing lower-cost workers in developing nations. Anecdotal evidence suggests that, though startups may initially use outsourcing as a strategy, often they opt to establish a subsidiary to improve their intellectual property protection, labor force control, and management efficiency. According to Shah (2005), the minimum size of an offshored operation can contain as few as 10 persons. If this is accurate, then it may be possible for many more small firms to establish subsidiaries in developing nations. Unfortunately, the available data on the scale and scope of offshoring by startups is unavailable.

It is tempting to view startup offshoring as an unmitigated loss of jobs for US workers. However, the reality is more complicated. Lowering the cost of undertaking a startup suggests that the cost of establishing a new firm would decrease possibly encouraging greater

domestic entrepreneurship. Any jobs created by this entrepreneurship should be counted against those lost to offshoring. For example, Rakesh Singh, Netscaler's General Manager of Asia Operations said, "The cost savings through outsourcing have helped us become more competitive and experience rapid growth as a company. As a result, we have a lot more employees in the US today than we did when we set up the India operations" (Tillman and Blasgen 2005).

For the developing nations receiving such startup offshoring the obvious benefit is employment. However, we believe that possibly even more important will be a multifaceted transfer of knowledge to the Indian employees. The first facet will be knowledge and real experience with how high-technology entrepreneurship works in cutting-edge technologies. The second facet will be an introduction to highly sophisticated users. The final facet will be an introduction to the global-class entrepreneurial support networks existing in Silicon Valley.¹¹ If potential Indian entrepreneurs gain this knowledge, then India could evolve a Silicon Valley-like ecosystem that would support and encourage high-technology startups.

(e) Indian Specialists

Even while developed nation firms establish subsidiaries in India, both existing Indian firms and entrepreneurial startups are offering contract services in medical transcription, tax preparation, map digitization, film animation, etc. Initially, Indian firms were handicapped by their lack of legitimacy, customer contacts, and domain knowledge. As Indian firms developed a customer base, they have often been able to

secure assignments requiring higher skills, thereby transforming their business proposition from offering simple labor cost arbitrage to providing significant value addition. For example, a publishing firm that initially only prepared drawings for chemistry texts now offers a full range of back-office services including copy-editing, XML formatting, and technical support (Thomson India 2005). It expanded its product list to include academic and professional journals and even time-sensitive publications such as newsletters. The enhanced capabilities allowed not only the addition of greater value, but also greater bargaining leverage with customers.

A new genre of specialists exemplified by firms such as Office Tiger (U.S. headquarters but all operations in India) and Evalueserve specialize in what is loosely termed “knowledge process outsourcing” (KPO). The KPO firms provide contract research, quantitative equity analysis, clinical results analysis, patent prior art research, legal research, and other services produced by highly skilled professionals (Aggarwal 2005). In technology fields there are also many opportunities for entrepreneurial Indian firms to offer engineering and other design services particularly to smaller Western firms wanting to lower their costs without having to establish an Indian subsidiary.

The emergence of Indian specialists roughly parallels the establishment of operations by foreign specialty firms. In these niches there are many opportunities for entrepreneurs to establish firms offering products and services based on deep domain expertise.

¹¹ On entrepreneurial support networks, see Kenney and Patton (2005).

(f) Indian Independents

The distinction between Indian specialists and independents is somewhat arbitrary, but it is meant to separate firms whose strategy is exploiting narrow niches from those established with the goals of providing general services such as call centers or claims processing. A number of the Independents now employ in excess of 6,000 persons and have large MNCs as major customers. The initial entrants such as Tracmail were established during the Internet Boom to provide back office services to U.S. Internet firms such as Amazon and Yahoo!. After the dot.com boom collapsed these firms switched from supplying services, such as answering emails and web-related questions to providing call centers, services, and claims processing. Indian Independents benefited from the recession that followed the collapse of the stock market bubble because it encouraged developed nation firms to seek ways to lower costs. This provided a market for Indian entrepreneurs who rapidly formed firms to provide services to foreign firms.

In the period from approximately 1999 through 2003, the number of call centers expanded rapidly. By 2003 issues such as the quality of Indian English-language capabilities, the difficulties of working late night hours, the lack of career paths for call center employees, a lack of opportunities for moving up the value chain for the Indian firm, cut-throat pricing, attrition, and training expenses encouraged the larger Independents to seek more back office work, .

For the Indian firm, back office work has many advantages. The most important advantage is that business activities are almost always a segment of a larger process. Successfully undertaking one activity can lead to opportunities to acquire other parts of the process, some of which hopefully will be higher value-added. An advantage is that back office work does not demand as high a proficiency in spoken English.

Also, business services need not be conducted in real time so the work can be done during the Indian day (U.S. night). More important, if more and higher skilled activities in the process can be transferred, then there is the potential for upward mobility by the Indian firm's employees, and it may be possible to increase profit margins. By 2004, Indian independents were diversifying away from the call center business into other areas such as accounting, finance, and purchasing. This diversification can be seen in Table Four, which compares the call center activities with non-call center work in offshore service providers.

TABLE FOUR ABOUT HERE

The market for the independents appears to be consolidating. For example, in May 2004 IBM purchased one of the largest independents, Daksh. In early 2006, the U.S. outsourcing giant EDS was in discussions to purchase the large Indian independent MphasiS. In 2003 the Indian software firm, Wipro, purchased a leading BPO firm, Spectramind, while in 2005 the Birla Group purchased Transworks. This suggests that survival for even the independents will be precarious. The smaller firms are unable to afford a strong overseas marketing presence and are not invited to bid on the best contracts. As a result they must take the least desirable commission-based cold calling contracts. The smallest independents (under 200 seats) seem to be leaving the marketplace (Vales 2003). The mid-sized firms (200-1,000 seats) might be acquired either by Indian firms or multinationals wishing to quickly establish an Indian presence. Only the largest and best-managed independents may be able to grow sufficiently to rival their competitors especially the MNC outsourcers, but also possibly Indian IT industry subsidiaries.

(g) Indian IT Industry Subsidiaries

The Indian software services (SS) firms, which provide outsourced programming and IT services to the global market, have grown remarkably rapidly over the last decade (Arora and Athreye 2002; Athreye 2005; Heeks 1996; D'Costa 2003; Singh; 2002). Using lower-cost Indian software talent, they captured significant global market share. Though still dwarfed by global market leaders such as IBM, HP, and Accenture, the Indian SS vendors are now large firms. For example, in 2005 the Indian leader, TCS, had sales of \$2 billion, and its two largest competitors, Infosys and Wipro had sales of in excess of \$1 billion. They, and the other Indian software leaders such as Satyam Computers and HCL, were the most internationally competitive Indian firms. They also had executive and managerial talent capable of securing overseas outsourcing contracts, managing the interface with foreign customers, and migrating activities across national and corporate boundaries.

Business process outsourcing was a strategic opportunity for the Indian SS firms, as they had a number of complementary assets, but also required a substantially different skill set. Their strategic question was whether to and how to enter this new industry. Each of the Indian SS firms developed a unique response to the opportunity. TCS seriously considered entering BPO and it did invest in a travel services subsidiary, from which it later withdrew, but ultimately decided to enter the industry organically by extensions of existing product lines (Nori 2005). Infosys had an entirely different response. It established an in-house subsidiary, Progeon, and hired executives particularly from the financial industry to manage the subsidiary. Though it did have call center operations, from Progeon's inception it emphasized high value-added back office work where it could draw upon the software skills of its parent to automate production. By 2005, Progeon had grown to

over 5,000 employees and was profitable (Bhargava 2005). As mentioned earlier, Wipro purchased Spectramind and rapidly expanded its call center operations in an effort to become the largest Indian call center service provider. Spectramind did grow rapidly, however in 2005 Wipro reorganized the call center operation by integrating it into Wipro (PTI 2005). Satyam also established an in-house subsidiary, but as of 2005 it was relatively small. Finally, HCL's in-house subsidiary, HCL BPO, grew rapidly. By acquiring and then expanding call centers in the UK, HCL BPO solved the language problems of Indian call center operations. The Indian operations were concentrated on back office work. Effectively each of the largest SS firms developed a different response to the opportunities in business services offshoring.

Given the significant advantages that the Indian SS firms had in terms of access to capital, linkages to customers, and experienced managers, it is surprising that only two of them, Progeon and HCL, thus far have experienced significant success providing services. There are similarities and differences between business processes and software services. Most important are the complementary assets that the SS firms can leverage. An important advantage the SS providers offer their affiliated business service operations is contacts and credibility with potential clients. Further for back office processes automation is software-based – an area in which the SS providers have significant assets. Progeon and HCL BPO are leveraging the capabilities of their parent firms to capture contracts, and these synergies may be more important in the future as customers seek to consolidate their outsourcing contracts to fewer vendors.

The differences between the SS and BP industries are also significant. First and foremost, workforces differ as does the work process. In the SS, the workforce and managers are engineers, while in business services normally the workers employees have commerce and social science backgrounds. In the case of call centers, the BP work often requires direct interaction with customers and the salient skills are

interpersonal. Customer interaction can be extremely stressful and cause high attrition rates placing a premium on workforce management. This problem is mitigated in back office services, as there is limited customer interaction. For back office services, the emphasis is on process management where efficiency, quality, and constant improvement are the keys to success. Here SS firms can deploy their software programming skills to introduce process efficiencies and even datamining techniques.

In summary, the leading Indian SS firms adopted quite different responses to the opportunities in services offshore outsourcing. The firms with the greatest success, Infosys and HCL BPO, also have different strategies. HCL BPO uses call centers in the UK to handle customer interaction, while Infosys has emphasized back office work and only accepts call center work as part of larger package that includes back office work (Bhargava 2005). Wipro's Spectramind business services subsidiary emphasized call centers until 2005 when it changed the business model for its subsidiary away from call center work and increasingly toward the back office. Given that the large MNC outsourcers are expanding their BP offerings the Indian SS firms will almost certainly require a business process subsidiary if they intend to compete with the MNC outsourcers such as IBM, HP, and Accenture.

Organizational Overview

Our taxonomy illustrates the organizational variety among firms in India providing services to the global economy and illustrates the depth and breadth of the labor pool in India. Each of these organizational forms has its own logic and thus is likely to persist. The MNC subsidiaries particularly those of the MNC outsourcers continue to proliferate and expand. Only a few of the Indian independents are likely to

survive, but in contrast to the commonly held belief that the Indian advantage is in call centers, the survivors are more likely to be those that develop the most sophisticated back office business. The Indian specialists also appear to be developing deep domain skills. If the large Indian SS firms wish to compete effectively with the MNC outsourcers, then they will have no choice but to establish strong BP operations. The diversity of service activities being offshored suggest that a complicated landscape of different organizational forms is emerging in India.

6. DISCUSSION AND CONCLUSION

The implications of the offshoring of service work are significant for both developed and developing nations. Service jobs, which formerly were rooted relatively close to where they were generated due to the sheer logistics of moving paper documents and formerly high telecommunications costs, have now been made mobile by technological improvements and an increasing willingness on the part of management to consider relocation offshore. During the next decade, it is likely that globalization will sweep through the formerly cosseted ranks of service workers. As enterprises seek to drive down their costs, a new round of globalization will occur within which a complicated multinational and likely multicorporate chain for data capture and processing will emerge. The old image of the developed nations concentrating on services and knowledge creation may give way to a world in which knowledge creation will become the critical factor – data and information will simply be commodities processed in Third World factories. But there is a critical caveat, our research showing that knowledge creation may also be relocated to developing nations such as India because there are well-educated individuals able to access globally available information, which they can utilize to create knowledge valuable to the global economy.

The offshoring of services to developing nations is thus becoming a and possibly, “the” critical international economic development issue. This paper has utilized a case study of India, the largest recipient of offshored services, to show that the growth in offshoring was intimately linked to the prior development of India’s software sector and an enabling regulatory and other institutional environment. Multinationals played a key role, although domestic firms were early adopters. The role of multinationals has deepened substantially moving from the large MNCs to include smaller firms, outsourcing specialists and innovative startups. As this has happened, the value-addition and sophistication of the work done has increased. The most sophisticated work being done in India increasingly resembles the most sophisticated work being done anywhere else and is to be found in startups and subsidiaries of multinational corporations, although domestic firms also are beginning to show the ability to do sophisticated work.

These findings raise important issues for structural adjustment in developed countries. The relocation of services offshore has the potential to reorganize the global economy even more profoundly than did the movement of manufacturing from developed to developing nations. India, in much the same way as China has been emblematic of a reorganization of the production of goods, may become emblematic of the location of service provision. For the developed nations already reeling from the continuing loss of manufacturing jobs, the emergence of developing nations as an option for firms aiming to lower the costs of providing services creates significant policy dilemmas concerning their appropriate responses.

In 2004, U.S. state and local governments were debating various laws forbidding the offshoring of government-related services, but there was little real action. It is possible that protectionist responses in the developed nations could increase in the coming years particularly if

there is an economic downturn. One new variable is that in the relocation of manufacturing jobs overseas, the affected employees were, for the most part, blue-collar workers; while in service offshoring white-collar, college-educated workers will be displaced. These workers are more politically active. This may force a reconsideration of the support for “free” trade.

A remarkable aspect of service offshoring that we have noted is the rapidity with which it can occur. Manufacturing’s movement offshore was a gradual migration that began in the early 1960s. Though punctuated by dramatic factory closings, there was an opportunity for the U.S. economy to adjust. This may not be true in services where the “objects” are pixels and electronic pulses that can be transmitted by photons and radio waves (Cohen et al. 2000; Kenney 1997). A number of the firms we studied in India experienced vertiginous growth as they expanded from start-up to 5,000 employees in less than three years. When a large number and variety of firms experience such growth rates, the cumulative effect can be enormous indeed.

Policy had an important role in India’s ability to lead this process. India is the beneficiary of a process of liberalization that began in the 1980s under Rajiv Gandhi, which encouraged foreign investment. This path of liberalization encouraged foreign firms to invest in India especially in the software industry. By not taxing profits from exports, the Indian government created a powerful incentive for entrepreneurs to concentrate on exporting. Though criticized by some (D’Costa 2003), it sensitized Indian businesses to the global market. By providing MNCs with a moderately business-friendly environment it encouraged them to seek new opportunities for using the high-quality, English-speaking Indian labor force. Telecommunications deregulation was critical, because it ignited competition that resulted in increasing

bandwidth, greater quality of service, and lower prices. For any nation seeking to follow India's lead, proper telecommunications policies are absolutely critical for success.

The ultimate dimensions of the service offshoring phenomenon are difficult to predict. Whereas, for the last two decades, manufacturing value chains increasingly extended across borders (Gereffi and Korzenwicz (eds.) 1994; Kenney with Florida (eds.) 2004), it appears nearly certain that this will soon be equally true about services. Policy makers in developed nations must begin to prepare for this eventuality by considering what the core advantages of their populations are. Here, we believe that the advantages will come from the sophisticated consumers in developed nations that set the fashion for most of the world's goods and from the creative clusters such as Hollywood for media (Scott 2002), Silicon Valley for technology (Kenney and Burg 2000), Paris for couture, Boston for mutual funds, Northern Italy for a wide variety of goods, Tokyo for consumer electronics, etc. Increasingly, if routine service activities can be relocated to lower wage nations, the advanced developed nations will have to compete in terms of superior creativity (Florida 2002).

For policy makers in the developing world, inexpensive telecommunications is opening a new world of opportunities in the export of services. The opportunities are substantial for Franco-phone Africa servicing France, Eastern Europe and even Turkey serving the Germany-speaking nations, China serving Japan (because of the similarities in the written languages), and Estonia providing for Finland. Though we concentrated on India in this paper, the Philippines is already providing services to the U.S. especially in terms of call centers and video animation as a back up for India. In all of these nations, there are opportunities for indigenous entrepreneurs.

Service offshoring will not be a miracle cure for the lack of employment and economic growth in developing nations. We have highlighted the combination of institutional reform, multinational experimentation, an established software industry, and a variety of skills that seem to have been essential ingredients for India's success. Thus, a country focusing on just one aspect of services such as call-centers may not succeed. A country that does not allow multinationals to provide domestic services might not be able to develop the skills to do higher-end work.

Perhaps, the most important policy conclusion from our research is that nations that do not educate their populations will have no opportunity to participate in the globalization of services. The service sector is infinitely rich in opportunities; developing nations with educated manpower should be able to create new economic activities and construct niches for themselves in a world economy that is increasingly connected by telecommunications networks. Even though the size of the opportunity is not yet entirely certain, the possibilities appear to be enormous, and while nations like India may address the entire spectrum of services, there will be opportunities for smaller nations to develop particular niches in terms of skills, temporal availability, and simply as back-up locations.

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Table One: The growth of the ITES sector in India

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05E
Employment – SW exports	110,000	162,000	170,000	205,000	270,000	345,000
Employment – ITES	42,000	70,000	106,000	180,000	253,500	348,000
Export revenue – SW	3.4	5.3	6.2	7.1	9.2	12.2
Export revenue – ITES	0.6	0.9	1.5	2.5	3.6	5.1

Source: Nasscom (2005), p 28 and 156

Note: Revenue is in \$ billion.

Table Two: Comparison of ITES Operating Costs in the U.S. and India

	Annual per person labor cost	G&A expense	Telecom	Property rental	Depreciation	Total
US	42,927	8,571	1,500	2,600	3,000	58,598
India	6,179	1,000	2,328	847	1,500	11,854

Source: Nasscom (2004) p. 64

Table Three: Employment Changes at Major Technology Firm for Vendor Payables after Transition to India and Implementation of New Software

Activity/ Number of Employees	January 2003	April 2004	Percentage Fewer Employees
Order Supplier Processing	19	13	46%
Invoice Processing	75	56	34%
Employee Reimbursement	11	9	22%
Help Desk/ CRC	27	19	42%
Payment	9	6	50%
Reporting Metrics	1	1	38%
Management and Administration	46	34	35%
Total	188	138	37%

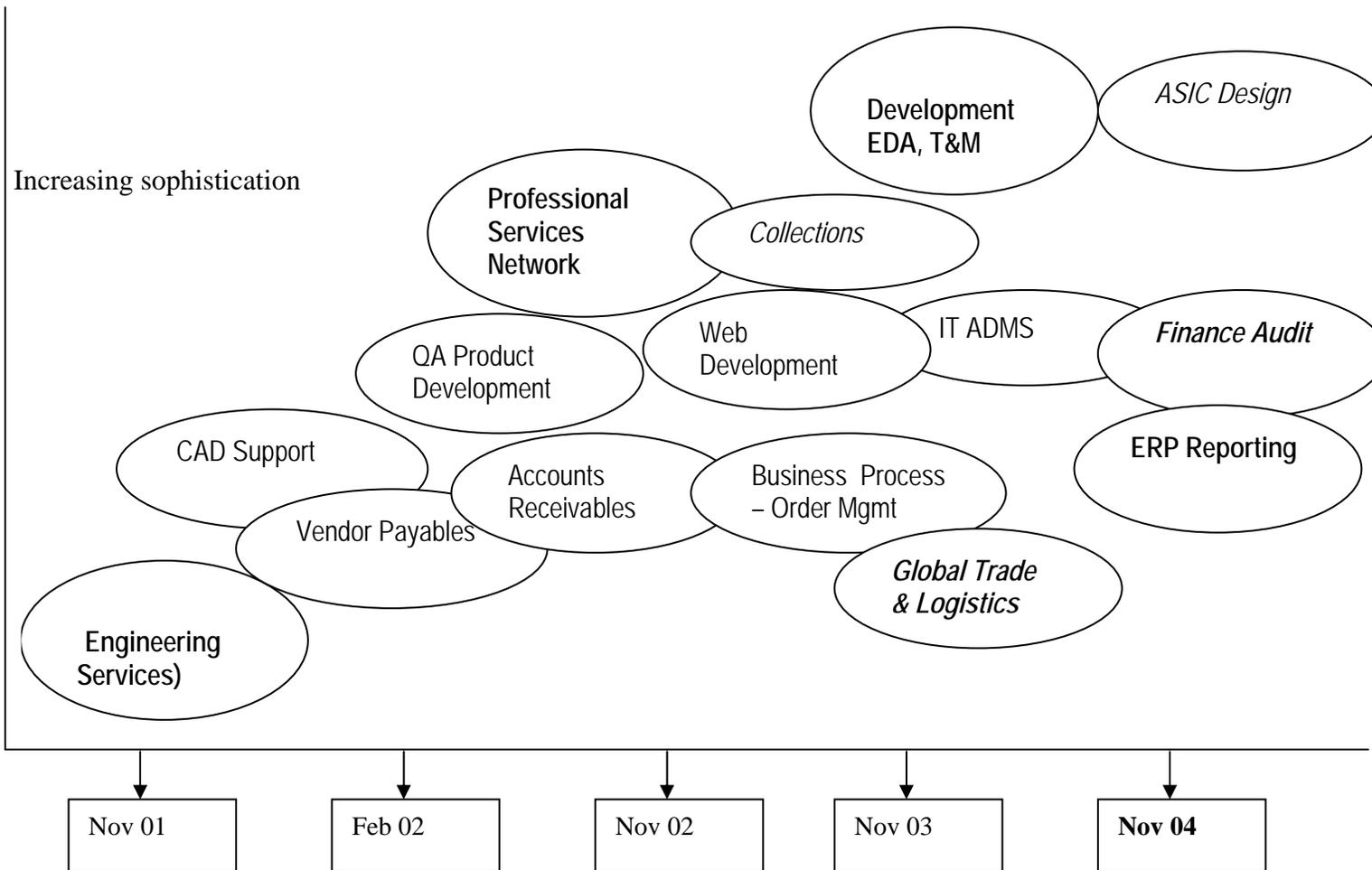
Source: Major Technology Firm 2005

Table Four: The Division between Call Center and other Back Office Activity in Selected Indian Services Firms

Firm	Call Center	Other Back Office
Wipro Spectramind	80	20
IBM Daksh	70	30
Infosys Progeon	30	70
Office Tiger	0	100
HCL BPO	90	10
ICICI Onesource	70	30
EXL	75	25
Msource	93	7
Tracmail	50	50

Source: *India Now* 2005: 51

Figure One: Activity Transfer to Major Technology Firm's Indian Operation by Date and Technology Sophistication



Source: Major U.S. technology firm, 2005

Figure Two: Taxonomy of Offshoring Firms

	In-house	Outsourced
Foreign Firms	<u>Quadrant One</u> MNC Subsidiaries Startup Subsidiaries	<u>Quadrant Two</u> MNC Outsourcers MNC Specialists
Indian Firms	<u>Quadrant Three</u> N/A	<u>Quadrant Four</u> Indian Independents Indian IT Subsidiaries Indian Specialists

Source: Author's compilation