

**Industrial Upgrading in India's
Information Technology Enabled Service Industry**

by

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*Where the mind is without fear
and the head is held high;*

Where knowledge is free;

*Where the world has not been
broken up into fragments by narrow
domestic walls;*

*Where words come out from
the depth of truth;*

*Where tireless striving stretches its
arms towards perfection;*

*Where the clear stream of reason
has not lost its way into the dreary
desert sand of dead habit;*

*Where the mind is led forward by
thee into ever-widening thought and
action...*

*Into that heaven of freedom, my
Father, let my country awake.*

Rabindranath Tagore¹

¹ Rabindranath Tagore is considered the national poet of India and his work was influential in the resistance in leading up to Indian Independence. This passage has appeared in two government reports: (Gupta, 2002) And the Introduction from the National Knowledge Commission report to the Nation in 2006: (National Knowledge Commission, 2007).

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Abbreviations & Acronyms

1 crore (cr) = 10 million

1 lakh (1) = 100, 000

ABR: American Board certified Radiologist. Medical doctor that is credentialed and legally able to provide diagnosis for patients in the United State's healthcare market.

ASSOCHAM: Association of Chamber of Commerce: trade association for Indian companies.

BTech: Bachelor of Technology: undergraduate technology-related degree.

BPO: Business process outsourcing.

CII: Confederation of Indian Industry.

DBS: Developmental bureaucratic state.

DNS: Developmental network state.

DoE: Department of Electronics: Indian government department, which oversees policy formation and implementation in all branches of electronics.

DoT: Department of Telecommunications: Indian government department, which oversees telecommunications policy formation and implementation.

EPZ: Export processing zone: designated areas within a country separated from domestic tariff area in which specific export-orientated regulation apply.

ELI: Export led industrialization.

FICCI: Federation for Indian Chambers of Commerce and Industry: trade association for Indian companies.

GoI: Government of India.

GRC: Global Radiology Centre: International teleradiology operation established through the partnership of Wipro and Manipal Hospital.

IIT: Indian Institute of Technology: System of top Indian technical universities.

IIM: Indian Institute of Management: System of top Indian technical universities.

IIT: Indian Institute of Information Technology.

ISI: import substitution industrialization.

ITES: Information technology enabled services.

KPO: Knowledge process outsourcing.

LPO: Legal process outsourcing.

MAIT: Manufacturers' Association for Information Technology: the main trade association for Indian hardware companies. A separate software industry association split from MAIT to form NASSCOM in 1988.

NASSCOM: National Associations of Software and Service Companies: The primary trade association representing the Software, IT and ITES industries.

PPP: Public-private partnerships.

STPI: Software technology parks of India

Abstract

**Industrial Upgrading in India's
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This dissertation analyzes industrial upgrading, the process by which industries move to higher value products and services in India's "offshore outsourcing" industry. The dissertation draws upon 101 semi-structured interviews with Indian managers, workers, trade association and government officials, collected during 14 months of field research in India, conducted between July 2006 and May 2009. The study examines how India obtained the knowledge and skills required to move up from low-level back office and call center work into knowledge intensive service delivery within the span of a decade. Four causal mechanisms are identified that enabled this upward move: 1) the role of trade associations 2) firm level knowledge transfer through migration and client interaction 3) firm level training programs and 4) firm level creation of cultural knowledge. Trade associations and firms emerged as the central actors driving industry development, with the state playing an increasingly supporting role. This institutional arrangement represents a departure from the Indian state's traditional approach to development and the

role of the state in other successful developmental models. A key reason why industry, rather than the state, assumed a leadership role in development is based upon the interactive nature of services themselves, which requires closer coordination between firms than manufacturing. The design of the dissertation centers upon the analysis of four firms that provide financial or medical services. Financial and medical services were selected based upon their different propensities to specialize within industries and expand in breadth across industries, thereby addressing the twin dimensions of industrial upgrading, scope and depth.

Chapter 1

Introduction to India's Offshore Service Model

During the early years of the millennium the world increasingly saw images in the media of a new, “Shining India,”² with depictions of relatively affluent, educated workers inside gleaming new office parks in urban centers (See Images 1-5 in Appendix). This representation of India was spurred by the rising economic prosperity of India, driven by a transformative shift to a service based economy that is best exemplified by the runaway success of “offshore outsourcing.”³ This industry emerged as India’s fastest growing in terms of gross domestic product (GDP) and is the leading developing country provider of offshore outsourcing services, commanding 55 percent of the global market (Dani, Ramesh, & Singh, 2011). The total Information Technology (IT) and Information Technology Enabled Services (ITES) service industry in India reached USD 71.7 billion, accounting for 5.8 percent of India’s GDP (NASSCOM, 2009a). India’s economic success in this industry has prompted other developing economies (e.g., China, Brazil, Philippines, Poland, Russia and South Africa) to try to replicate the high growth rates associated with India’s service export model (Business India Intelligence, 2006).

² “Shining India” was a political slogan used to capture the feeling of optimism in the wake of the IT and ITES service boom in 2003. The slogan was adopted and popularized by the Bharatiya Janata Party (BJP) during the run up to the 2004 Indian central election, which they lost. I, and my interview subjects, use the phrase “shining India” as a symbol of the IT boom, rather than a reference to the 2004 political election it is also associated with.

³ Offshore outsourcing refers to the practice of hiring an external firm to perform a business function from an overseas country from where the good or service will be sold or consumed. This differs from outsourcing, which refers to hiring an external domestic firm, and offshoring, which refers to hiring foreign labor by a company subsidiary. Offshore outsourcing is theoretically of the greatest interest because it requires domestic firms in developing countries to build technical and managerial knowledge and firm level capabilities.

The ITES industry began in India in the mid-1990s with back office data entry, followed by call centers; buoyed by labor savings of 60 to 70 percent relative to developed markets. Since 2000 India has achieved a measure of success in moving into “knowledge-intensive” professional services, such as radiology, accounting, research and development, and legal services (Aggarwal, 2010a; Evalueserve, 2003; Knowledge@Wharton, 2007; F. Levy & Yu, 2006; Pollack, 2003; Timmons, 2010). India’s market share of the “knowledge process outsourcing” (KPO) industry is 70 percent world wide and the industry is expected to grow to \$17 billion in revenue by 2013 (Aggarwal, 2010a) (see Table 1.1: Skill Upgrading for Indian ITES Exports).

How did a developing country that was best known for its high rates of poverty, illiteracy, and a “Hindu rate of growth”⁴ that hovered between 3 and 4 percent gross domestic product (GDP) give rise to the developing world’s most dynamic, high growth, and knowledge intensive service sector? More specifically, how did India obtain the *knowledge* and *skills* required to move up from low-level back office and call center work into knowledge intensive service delivery within the span of a decade? Who are the key *actors* in industry development and promotion? What are the skills and knowledge required for this sector? What are the *sources* of industry capabilities? What are the key industrial *policies* that enabled the sector and how were they crafted? The focus of this dissertation is on the development and creation of the skills, knowledge, actors, and policies that help to explain this transformation.

⁴ This commonly used expression is attributed to economist Raj Krishna, although I was unable to determine where he first used the term. A number of studies make reference to this term. See Chibber (2004).

Table 1.1: Skill Upgrading in Indian ITES Exports

Skill	Typical role profile	Emergence	Skill Profile/ Training
Low Skilled Services	Data entry	Late-1980s - mid-1990s	Computer skills required. College education desired, but not required
Medium Skill Services	Call center	Mid-1990s	Command of foreign language & interpersonal skills required. Usually college educated.
Knowledge Intensive Services	Professional work (financial planning, radiology, etc)	Early-2000s	Interpretive abilities, college degree, additional training required. Often post graduate training & professional certification

I. Foundations for Industrial Development & the Shift to Services

Economic development, at its most macro scale, is a sequential shift from employment concentration in agriculture to manufacturing industries and finally to services (Clark, 1940; Fisher, 1935). Yet, such shifts are not inevitable or even likely. Many regions in the world, such as much of Latin America, continue to export extractive commodities and agricultural products to the rest of the world thereby occupying the same low-level position in the global economy that they have occupied for centuries (Bunker, 1984; Cardoso, 1972; Evans, 1979; Frank, 1972; Wallerstein, 1974). While there is a remarkable stability in the economic position of states in the international division of labor, some developing states (China, India, South Korea, Malaysia, Taiwan, and Thailand in Asia; Argentina, Brazil, Chile, and Mexico in Latin America; and Turkey in the Middle East) have moved into increasingly sophisticated manufacturing and technological industries. This industrial shift was instrumental in raising the general standard of living for the citizens of these countries.

The key mechanism that permits these countries to transition into manufacturing and technological industries is “industrial upgrading.” Industrial upgrading is defined as a process where economic actors, such as nations, industries, firms, and workers, move from low-value to high-value activities (Gereffi, 2005). Upgrading may occur along two dimensions: specialization within an industry and increased breadth across multiple industries. Industrial upgrading success relies upon a mix of different government policies, institutions, corporate strategies, technologies, and worker skills (Gereffi, 2005, p. 171). A key enabler of this process is what Alice Amsden refers to as the creation of knowledge-based assets, which are firm specific technical and managerial capabilities (Amsden, 2001). Knowledge in this sense is more than mere access to information. Amsden’s refinement of the way knowledge is used as a competitive advantage for developing nations builds upon a broad tradition that highlights the centrality of knowledge. The role of information and knowledge has been referred to as the defining feature this stage of capitalism (Bell, 1973; Castells, 1996; NASSCOM, 2006b). Other scholars have argued that knowledge has become the key resource (Drucker, 1969) and access to it shapes the competitive advantage of both firms (Nonaka & Takeuchi, 1995) and nations (Castells, 1996).

Yet, a range of scholarship has also challenged the common conceptions of both knowledge and skills. Knowledge, at its most basic level, is constructed (Berger & Luckmann, 1967). More recently, some scholars have rejected treating knowledge as a commodity, classifying it instead as a “fictitious” or “quasi commodity” (Jessop, 2007). In a similar fashion, scholars from divergent theoretical traditions have problematized positivist conceptions of skill, which tend to define skill in terms of personal attributes or

job complexity (Spenner, 1979, 1983). Neo-classical economists, adopting a positivist orientation, tend to view skill development in terms of investment in “human capital,” or number of years of vocational training, formal education, and years on the job (Becker, 1962, 1996). However, neo-Weberian and social constructionist approaches to skills emphasize their *relational* nature. From this perspective skill construction depends upon the relationship between tasks, the supply and demand of people who complete tasks, and those who fill positions or are excluded (Attewell, 1990, pp. 444-445). Credentialism and professional labor monopolies are two ways skills are defined and groups are excluded from job consideration (Abbott, 1988; Collins, 1979). The constructed or potentially fictitious quality of knowledge, and the relational nature of skills, however, does not make either knowledge or skills less important to development. In fact, as this dissertation will suggest, the ability of industries in developing countries to construct knowledge, and perceptions of it, is itself a key capability for development and a crucial piece of building knowledge based assets. Development that creates knowledge-based assets is distinguished from exploitative extractive developmental practices that may lead to economic growth, but not a long-term sustainable advantage.

Scholarly analysis of industrial development and upgrading is concentrated on high-tech manufacturing and retail industries, rather than services. A reason why services received comparatively less attention is that a broad group of social scientists initially did not believe services could be delivered from geographically distant locations. This was because services required interaction between a producer and consumer and were difficult to transport (Lievens, Moenaert, & Jegers, 1999; Lovelock & Gummesson, 2004). Social scientists noted that the manufacturing subcontracting relationships well

documented in manufacturing industries were not possible in the trade of modern services:

The major difference between a mature high-tech industry and a modern service is that there is no international (or intranational) subcontracting. Foreign firms cannot out-source the provision of many services in the same way that they can out-source the manufacture of certain products (Amsden & Chu, 2003, p. 13).

The empirical realities of a large globally dispersed ITES industry that is increasingly using subcontracting relationships challenge this assertion. The global spread of telephony and Internet technologies made it possible for a growing subset of services to be produced offshore during the 1990s, intensifying during the early 2000s. This scaling up of services in developing countries was in due in part to progress in the communications infrastructure in developing countries, which reduced the costs and difficulty in procuring reliable communication technologies to trade services at a large scale over long distances.⁵ Today, the IT enabled service industry is following the basic trend of increasing fragmentation observed in manufacturing production, splitting up activities that increasingly stretch across borders, in order to reduce costs and gain access to the right mix of skills.

An analysis of industrial upgrading in services is warranted because developing countries are now beginning to join developed countries in transitioning to a service-based economy. Services have emerged as the largest and fastest-growing sector in the global economy during the last two decades, providing more than 60 percent of global output (Banga, 2005b). Developed economies tend to have a high concentration of service employment, however, some developing countries, like their developed country counterparts, are also becoming service-based economies. The Indian economy is one

⁵ The rise in communication technologies globally helped to challenge Canada's dominance in service trade with the United States.

example of a country now dominated by services. Services constituted 50 percent GDP in 2004, while industry and agriculture were 27 and 23 percent respectively (Banga, 2005a). This global economic shift to service work underscores the need to understand potential upgrading processes within developing countries' service industries. An analysis of the ITES sector, specifically, is important not only because it involves different agents (i.e. skilled white-collar workers) than those found in manufacturing and retail industries, but also because existing theories for understanding outsourcing do not explicitly consider the transmission of knowledge required in the international offshoring of services (Trefler, 2005).

II. The Argument

The major findings of this dissertation complicate the foregoing understanding of upgrading. The Indian model of service development is shaped by the interaction of multiple actors, including the state, trade associations, and firms, who work to upgrade industry skills and to signal industry credibility in higher-level skills to the export market. This model of development emerged only after several constitutive shifts in the Indian state's approach. After independence, India was committed to industrial development and pursued a traditional state-led industrialization policy, which provided key investments in education and created industrial policies that supported subsequent IT and ITES industry development.⁶ The state underwent reforms in response to internal and external pressures,

⁶ This dissertation focuses on IT enabled services (ITES). IT and ITES are separate industries, but are commonly grouped together by policy makers and in policy documents and represented by the same industry trade association (NASSCOM). The ITES industry was built upon the communication infrastructure and policy frameworks that were established through interaction between the state and the IT industry that occurred earlier. The acquisition of leading ITES firms by leading IT companies, which began in 2002, makes it difficult to analytically separate these industries even while the work differs in scope and skill requirements. As a result, I will often group these industries together, referring to them collectively at

which in turn shaped its role and approach to development. The business association-led developmental model that emerged during this shift addressed constraints facing IT and ITES industry development. Yet, the state and associations were not the only key actors in the rise of this sector. Indian firms also built and gained knowledge through the migration of technical professionals, through client relationships that facilitated knowledge transfer, and through firm level training programs. In addition to technical capabilities, which were required in manufacturing industries, this knowledge included cultural capabilities, which I argue are critical to ITES industry development. These new capabilities are specific cultural repertoires that meet the expectations of customers, who are often located in regions far away from the worker providing the service. Analyzing cultural knowledge as well as other related practices and norms adopted by firms in their interactions with clients, I argue that upgrading depends upon both a deepening of industry skills and an ability to signal credibility in providing higher-level work.

The dissertation advances four central theses that explain the successful upgrading of India's ITES industry into knowledge intensive services:

1. **Emergence of an association-led developmental model:** An industry led, state supported model of development emerged from a more traditional state led (industry-constrained) pattern of industrialization. Trade associations were a key emergent actor, influencing neoliberal state practices, and helping to refine and draft industrial and education policies in key areas that enable industrial upgrading.

times as the "IT industry," when discussing industry constraints and policy formation. "ITES" is a broad umbrella term that emphasizes a mode of delivery that encompasses Business Process Outsourcing (BPO) and the higher value Knowledge Process Outsourcing (KPO) sub-sectors, which are defined in terms of their function and skill-set respectively.

2. **Inter-firm learning and knowledge transfer:** Knowledge transfer from organizations based in developed countries to those in developing countries is crucial for industry upgrading into higher value services. This transfer of knowledge may occur through two mechanisms: migration of technical labor and through client relationships that facilitate learning. Mediating factors, however, determine the extent and speed to which knowledge transfer occurs. These factors include task integration with client business processes and systems, the authority of professions, and the power of credentials.
3. **Knowledge creation and firm-led employee upgrading:** Industry knowledge is created through high levels of firm investments in skills training, the construction of corporate training facilities, and universities. Firm level investments in employee education supplementing the skills created through the educational system.
4. **Cultural labor and skills:** Interaction intensive services required a new set of skills and capabilities for development, composed of a number of learned distinct cultural skills, scripts, and behaviors that permit workers to mimic the communication style and cultural expectations of their customers and mask (or understate) their national identity from overseas customers.

I will elaborate upon each of these four claims under each of the proceeding sub-headings, offering some background and context for the in-depth analyses in the chapters that follow.

III. Emergence of an association-led developmental model

The appropriate role of the state in the economy is a perennial theoretical and practical question. While previous debates tend to treat the state and economy as distinct and separate entities, contemporary scholars increasingly reject this binary conception (Block, 1994; Block & Evans, 2005). Some writers argue that states and markets are not engaged in a zero sum game where one benefits at the expense of the other (J. D. Levy, 2006). Rather states and markets historically evolved together and markets require the regulation that states provide (K. Polanyi, 2001 [1944]). Yet, the pervasive dichotomous view between the state and the market still prevents researchers from understanding how state and market actors coordinate policy (Krippner, 2007).

Contemporary states are grappling with new challenges posed by the economy, technology, and ideology (J. D. Levy, 2006). A growing body of work argues that state authority is in decline due to the increasing pressures of globalization (Sassen, 2001; Slaughter, 2004; Strange, 1996). Technological innovations and increased access to the Internet have accelerated the movement of capital and jobs across borders, further dispersing production globally (Friedman, 2005). In the face of these technological changes states have lost a measure of power to control capital and firms, which have become more mobile than ever before. While critics insist that arguments about the irrelevance of the state are overdrawn because states retain control over their territorial borders, control their populations, and define citizenship, they concede that states have relinquished some authority to supranational organizations (Hirst & Thompson, 1995).

State industrial policy is constrained by the rise of supranational organizations. Regulatory agreements (e.g. TRIMS, GATS, and TRIPS) make illegal many of the

developmental policy instruments successfully used by East Asian developmental states to nurture their own strategic manufacturing industries (Wade, 2003). The actions of the WTO are emblematic of the policies supported by many supranational organizations, such as the IMF and World Bank, and the “Washington Consensus” more generally.⁷ The Washington Consensus widely advocated a shift from state-led governance toward market-oriented policies and also encouraged a re-framing of developmental problems and policy justifications (Gore, 2000). These supranational policy prescriptions imposed upon developing states reflect the neoliberal ideology that guided them.

The ascendancy of neoliberal ideology poses its own set of challenges to state authority and practices. Neoliberalism as a theory lacks coherence,⁸ but finds its most coherent expression within the state (Plant, 2010). Despite this incoherence neoliberal policies tend to reflect one or more of the following ideas: free markets, market fundamentalism,⁹ deregulation, and the limited role of government (Antonio, 2007). Here it is important to distinguish scholarship that views neoliberalism as an ideological project from scholarship that is more centrally focused on understanding its changing institutional practices.¹⁰ While neoliberalism has changed the “idea” of the state (Bourdieu, Wacquant, & Farage, 1994) it has also shifted the institutional practices associated with the state (Hall & Soskice, 2001; Krippner, 2007).

Successful states are increasingly fostering ties to industry and associated actors to help drive economic development. These ties between state and society, referred to as

⁷ For an in-depth analysis of the IMF see (Stiglitz, 2002). For an overview on the various and sometimes contradictory usages of the term “Washington Consensus” see (Williamson, 2000).

⁸ This incoherence is due to its advocates’ tendency to incorporate elements of other theories into its own theoretical doctrine (Peck, 2004).

⁹ Market fundamentalism refers to the idea that society should be “subordinated to a system of self-regulating markets” (Somers & Block, 2005).

¹⁰ For an overview of scholarship on neoliberalism as an ideological project versus those more concerned with its changing institutional practices see (Krippner, 2007).

embeddedness, are a central feature of development (Breznitz, 2007; Evans, 1995; O’Riain, 2000, 2004; Pingle, 1999). Developmental states range from the developmental bureaucratic state (DBS), associated with the industrial success of the East Asian economies, to decentralized developmental networked state (DNS), defined by their ability to nurture local and global technology and business networks (O’Riain, 2000).¹¹ DNS states represent a diverse range of cases that include Ireland, Israel, Taiwan (O’Riain, 2000, p. 186), the United States (Block, 2008; Block & Keller, 2011), and China (Appelbaum, Parker, Cao, & Gereffi, 2011).¹² The diversity in cases also reflects a recognition that forms of state embeddedness vary, leading to industrial systems that have differing strengths, weaknesses, and ties to the global market place (Breznitz, 2007). This body of work also advances an understanding of the amorphous and unfixed boundaries of the state and its associated institutions (Jessop, 1990). This underscores a shift to new state practices that rely on quasi-state institutions and industries for development and implementation.

Much of the existing scholarship focusing on the influence of neoliberalism on state practices tends to focus on privatization and deregulation. The focus on deregulation as a key component of neoliberalism is problematic, however, because it obscures the current practices of states in two specific ways. First, while deregulation suggests that states exit deregulated industries, it is more accurate to refer to *reregulation* where states continue to be involved in regulating the industry, but in different ways (Majone, 1990). Second,

¹¹ See (Block, 2008; O’Riain, 2004) for the distinction between the DBS and the DNS. The DBS model allowed East Asian economies to move up into higher value electronics manufacturing through industry incentives and the state’s ability to discipline capital in accordance with state planning. India aspired to be a DBS state, but largely failed in its ability to induce and discipline capital to act according to the state’s industrial plans and in achieving its stated developmental goals (Chibber, 2004).

¹² China is not an exclusively top down developmental state model. Rather, it combines government agencies, market forces, input from scientific and professional communities (Appelbaum, et al., 2011, p. 225).

Public Private Partnerships (PPP) are an increasingly dominant strategy of development in countries that lack the capital, resources, expertise, and capabilities to implement development projects. These partnerships extend Evans's observation that the state needs business as a source of decentralized knowledge about what is possible and as implementers of developmental projects (Evans, 1997, p. 70). Traditionally, the goal of these partnerships was to provide infrastructure (e.g, transportation, power, and communications), but the scope of these partnerships are broadening to include new domains of the state, such as design of educational policy and the construction of new universities.

The “varieties of capitalism” literature sheds some light on the relationship between the state and market, yet still does not fully account for the role trade associations play in engaging the state. From the perspective of this literature, firms are conceived of as major actors and business associations are acknowledged to play a coordinating role between the state and society. In this respect this literature shares some similarities with state-society approaches, which suggest that market economies are embedded within a civil society that is both structured by and helps to structure the state (Block & Evans, 2005). On this account, civil society includes a variety of nongovernmental associations such as trade associations, social movements, and political parties (Habermas, 1989). The “varieties of capitalism” literature, however, exaggerates the role of the employer along two dimensions. First, while states may adopt certain neoliberal policies favored by employers, states may also initiate the adoption of an expanded scope for decentralized decision making and invite private actors to participate in policy making decisions (Howell, 2006). Second, employers are characterized by

internal divisions that may make consensus difficult to reach (Cowhey & Richards, 2006; J. D. Levy, 2006) and therefore collective action difficult to initiate or sustain. Sector specific industry trade associations, where consensus is easier to produce relative to umbrella associations, may offer a mechanism for employer coordination in this regard. Yet, the “varieties of capitalism” literature fails to show the potential depth of the role these civil society actors may play in setting the agenda of the state, designing state industrial policies, and ultimately taking over state responsibilities. Trade associations, with frequent interaction with the government and a degree of autonomy from the demands of everyday business activities, may have the capacity to sustain interaction with governmental actors over a longer period than firms alone. These organizations may be even more influential in upgrading in developing countries, since developing countries tend to have weaker institutions and less coherent state governments than their developed country counterparts.¹³

The rise of India’s ITES service points to a model of development that is driven by private and quasi-state actors that lead industrial upgrading, policy formation, the creation of new skills, industry training, and capabilities for ITES development. This does not mean, however, that the state was absent or uninvolved in skill and knowledge development, industrial policy, and sector formation. In fact, the state was instrumental in creating the initial knowledge base for the emergence of the IT and ITES industries through investments in education, drafting early industry policies that helped support an emerging sector, such as exemptions on hardware import taxes and revenue taxes on software and service exports, creation of communication infrastructure and dedicated

¹³ Even coherent Weberian bureaucracies in developing countries may be undermined by bureaucratic rule following, producing a less coherent state (Chibber, 2002).

technology industrial parks, as well as coordinating with and implementing industry and trade associations' recommendations.

The current approach to industrialization in India constitutes a hybrid model of development: firms and trade associations *in partnership with the state* emerged as the central actors leading industrial upgrading. The Indian model of development changed over time from an *aspiring* developmental state characterized by autarky (Chibber, 2004; Evans, 1995) toward a more decentralized and flexible developmental state that relies upon close cooperation with firms to identify and support strategic sectors and innovations. In this way, the Indian state failed to approximate the centralized developmental bureaucratic state (DBS) associated with the industrial success of the East Asian economies, and toward a state more similar to a decentralized developmental networked state (DNS).

The shift in India's state strategy toward development began in the 1980s when the Indian state began to slowly reform (Chibber, 2004; Evans, 1995; Kohli, 2004; Panagariya, 2008; Pingle, 1999). The reform process advanced unevenly across industrial sectors, agencies, and states. The Indian IT sector, the government agencies responsible for promoting IT growth, and leading state governments, were on the cutting edge of these reforms and best exemplify the Indian state's new approach to development. This change in India's approach to development was part of a broader shift in government away from an import substituting industrialization (ISI) model of development and socialist orientation characterized by self reliance and an antagonistic relationship to business, toward one that emphasized an increased focus on exports and a more business

friendly orientation.¹⁴ Yet, it is a mistake to view this shift simply as becoming more business friendly; it was a new way of doing business in India, one that involved new partners, pursuing new capabilities.

Under the “traditional” state-based approach, the Indian state was instrumental in creating the initial knowledge base for the emergence and upgrading of the IT and ITES industry in India. The Indian state was the key initial actor in creating the knowledge base for late industrialization through the development of institutions of higher education capable of producing high numbers of technical talent. Despite the fact that the top end of the Indian higher educational system produced world-class technical talent, the system failed to generate a sufficient quantity of high quality graduates to meet the country’s growing industrial needs starting in the 1980s. In addition, the best and brightest graduates produced by the Indian educational system tended to leave the country through a process of “brain drain” that has only begun to reverse in the early 2000s (Saxenian, 2006).

The Indian state was also important in establishing one of the first software policies in the developing world in the early 1970s, although a *coherent* industrial policy focused on software promotion and development only emerged in the 1980s (Heeks, 1996). The software policies from the 1980s onwards were fine-tuned by the involvement of private industry and association involvement and beginning in the 1990s were broadened to apply to the emerging ITES industries. Therefore, state actions in education and industrial policy were necessary, yet insufficient factors explaining the rise of the ITES industry and subsequent industrial upgrading.

The hybrid model of development through which firms and trade associations emerged as central actors (in partnership with the state), leading later stage industrial

¹⁴ For more explanation on India’s ISI orientation see Chibber (2004) and Pingle (1999).

upgrading, was prompted by shifting institutional arrangements. Some of these institutional shifts were not specific to India, but constrain an array of states' abilities to use a bureaucratic developmental state strategy to pursue future development. For example, international trade agreements constrained states from protecting fledgling strategic industries through trade protectionism in manufacturing and service industries (Wade, 2003).¹⁵ Some developmental states, such as Korea and Japan, had trouble adapting to decentralized industry structures and shifts in financial markets, as became evident during the 1997-98 Asian financial crisis (O'Riain, 2000).

Other institutional changes affected India specifically. The Indian state's role as the "License Raj," characterized by high levels of regulation, reached its zenith in the mid-1970s. This regulatory approach, in particular, hindered the growth of small and medium sized businesses that lacked the resources and political connections to navigate the system (Chibber, 2004). Beginning in the early to mid-1980s the Indian state began to adopt a more congenial attitude toward business and began to work more cooperatively with them on industrial development. The state shift in orientation was due to the slow liberalization of government policy that began under Prime Minister Rajiv Gandhi in the mid-1980s (Kohli, 2004), the collapse of the USSR, which hitherto provided India with a developmental model and a counterweight to neoliberal hegemony, and India's 1991 balance of a trade crisis that prompted the government to accelerate the structural reforms that were already underway. This shift allowed industry trade associations and private firms emerging during the 1980s to slowly have more leadership and control over industrial development.

¹⁵ TRIMS and GATS limited developing state governments' ability to constrain companies operating in their territory (See Wade, 2003).

A central findings of this dissertation is that trade associations, moving beyond playing a coordinating role with the state, may become quasi-state actors that lead policy formation and implementation in select areas traditionally viewed as state responsibilities, such as education and industrial cluster development. In an era of globalization and neoliberalism, developing market economies have increasingly turned toward decentralized developmental governance models that more explicitly rely upon a variety of civil society actors. Through trade associations, firm level practices in training (technical, industry, and cultural skills) are “pulled-up,” aggregated, and disseminated to policy makers to shape the future industry policy agenda.

IV. Inter-firm learning and knowledge transfer

The global value chain (GVC) and the “varieties of capitalism” literature demonstrate that firm-to-firm interactions, especially through supplier networks, are an important source of industry learning (Gereffi, 2005; Hall & Soskice, 2001). Moreover, this work suggests that skills upgrading is particularly important for firms attempting to move into higher value activities (Gereffi, 1999). In turn, sustained interaction through supplier networks leads to knowledge transfer, predominately flowing from firms based in more developed regions to firms in less developed regions.¹⁶ AnnaLee Saxenian (2006) found that US educated immigrant engineers transferred technology “know-how” that enabled their countries of origin develop strategic industries. Yet, mediating factors, such as dependence on clients and professional associations, can place limits on the rate and height of upgrading. The extent to which particular tasks assigned to offshore firms

¹⁶ This literature also recognizes that participation in trade networks may lead some trading partners to decline relative to others (Hopkins and Wallerstein, 1986; Gereffi and Kozeniewicz, 1994). As a result, trade alone may not improve a firm or country’s position in the international division of labor.

are integrated with client business processes and systems shape the degree of coordination and learning firms obtain from their clients. In medical services, it is the authority of professions to create labor monopolies over designated tasks through credentialism, thereby excluding some workers, that determines if clients are a significant source of firm learning. Based on the interaction between these mechanisms and mediating factors, knowledge transfer through “reverse” migration results in a faster rate of upgrading, while occupational groups, such as professional associations may place limits on the growth and scalability of professional services in developing countries, despite access to the requisite technical skills. These findings have implications for policy incentives for development.

V. Knowledge creation and firm-led employee upgrading

The developmental literature acknowledges the role of internal firm processes; it is often to highlight the barriers to industry and national development created through firm efforts to retain proprietary, firm-specific knowledge (Amsden, 2001). However, firms are also recognized to be a source of decentralized knowledge and implementers of development projects for the state (Evans, 1997), as well as sources of knowledge creation and skills training within the labor force. The varieties of capitalism literature highlights the sphere of vocational training and education as central areas where firms must develop relationships with various actors to resolve coordination problems in the area of job skills (Hall & Soskice, 2001, p. 7). Based on the cases described in this study, firms emerge as key agents in creating knowledge and skills through intensive training and the establishment of corporate universities. Firm-level training upgrades and

complements employee level skills and knowledge acquired through the educational system. In particular, firms developed three types of knowledge. First, corporate training programs develop technical knowledge in particular domains, such as interpretive skill in radiology or the ability to create mathematical models in financial services. Second, firms develop industry knowledge by providing lessons on historic and evolving industry trends. Third, firms provide cultural and soft skills training in order to develop interactive skills to be used in interactive service delivery.

VI. Cultural labor and skills

Extending Amsden's framework on knowledge-based assets, I argue that cultural skills are an important, yet neglected, component of the knowledge-based asset concept. In order to extend Amsden's framework I draw upon three additional strands of work; cultural sociology, the sociology of work, and post-colonial theory. Cultural sociology has been instrumental in identifying how culture shapes skills as individuals respond to their external environment (Bourdieu, 1977; Swidler, 1986). Bourdieu's concept of *habitus* provides insight into culturally-based skills by explaining how individuals within a given culture share an understanding of the tacit "rules of the game" (Bourdieu & Wacquant, 1992). Swidler's "tool kit" model of culture offers a complementary perspective to Bourdieu, defining culture is a resource, or a repertoire of skills that directs individuals' action (Swidler, 1986, 2001). Skills provide the major link between culture and action and are composed of "habits, practices, and other 'cultured capacities,' such as intuitive capacities for perception and judgment, that have to be learned and that people

can't perform with confidence unless they get reasonably good at them" (Swidler, 2008, p. 616).

Cultural skills are particularly important in the trade of services because service work is interaction intensive, difficult to measure, and the production of a service cannot be separated from its consumption. Conversely, manufactured commodities can be produced to fit design specifications, measured to assess product conformity to product design, and then stored in inventory. In services, this process is more difficult because service quality requires more subjective interpretation and production and consumption are more tightly linked. Ultimately, service quality is what the customer says it is. Services are provided through interpersonal interaction that is shaped by one's socialization and cultural expectations. Therefore, the manner in which services are provided shapes the perception of the quality of that service. As a result, a key capability in delivering services across cultural boundaries is the adaptation of the provider to the cultural expectations of their client. I describe this management of cultural repertoire as the performance of *cultural labor*. Cultural labor is embodied in the individual employee; aggregated, it is an important capability that determines upgrading success in the IT enables services.

The cultural labor concept takes a sociological approach to skills being historical situated in broader relations of power and enduring colonial relations between the developed and developing. The colonial system perpetuated binary conceptions between East and West, noting that they were "constitutive;" one could not occur without the other (Said, 1979). The concept of "cultural labor" is a micro-level analysis of the skills required in cross-cultural business. The analysis follows Homi Bhabha's observation

where colonialism was never to liberate natives, but rather to reproduce the colonized as *almost the same but not quite/white* (Bhabha, 1994). The cultural skills valued within the IT and ITES industry, and the training practices that produce those skills, must be also viewed within broader historical relations, rooted in colonialism. The training programs build cultural skills based upon generalizations of how Indian workers behave. Yet, it is dangerous and inaccurate to perpetuate stereotyped impressions of heterogeneous groups (Spivak, 1988). The perpetuation of Indian culture characterized by a “culture of deference” (Nadeem, 2011) is one example of how essentializing characterizations are identified and eliminated through training programs. These practices demonstrate how the very skills valued in the ITES industry are relational and constructed by relations of power.

VII. Design & Case Selection

In order to understand the implications of this shift toward services the category of “services” needs to be further disaggregated. There are two main reasons for this disaggregation. First, industrial upgrading occurs when there is a move from low-value to high-value work and this often occurs within a narrow industry category. An example of this is a move from low-value assembly to high-value design work within technology manufacturing (Gereffi, 1999). Second, the broad industrial category of “services” is notoriously difficult to define because it is a residual category used to refer to any activities that are *not* agriculture, mining, or manufacturing (Banga, 2005a; Dossani & Kenney, 2006). The heterogeneity of services makes theorizing about service upgrading exceedingly difficult. To focus the dissertation theoretically I focus on services that can

be fulfilled remotely through information, Internet, and telephony technologies; commonly referred to as IT enabled services (ITES) by industry insiders, policy analysts, and government officials.

The ITES industry itself contains a wide variety of activities that range from back office (data-entry, transaction processing, technical support); sales and customer care departments (call centers), to professional services (such as legal, radiology, and accounting). This study compares the skills required in two knowledge intensive professional service industries: financial and medical services. It is these higher-level skills that are most important for India's ability to retain a long-term advantage in services, which is critical to sustained economic development in the country. I selected the financial and medical ITES industries based upon their different propensities to specialize within industries and expand in breadth across industries, thereby addressing the twin dimensions of industrial upgrading, scope and depth. Medical services contribute to a greater degree of specialized industry learning since these services are niche products and they require specialized skills. Conversely, financial services are generic and show more potential to expand in breadth by producing services that are used by multiple industries.

The financial services industry is one of the most monetarily significant arenas within the Indian ITES service industry, accounting for 40 percent of the total \$4.6 billion gross revenues generated in the country's service sector (NASSCOM, 2006a). The size of the medical services export industry is more difficult to measure because industry statistics are difficult to separate from general hospital services and there are a number of medical services business associations unevenly distributed across the industry. Medical

transcription was one of the first services to be offshored to India in the early 1990s and the business has grown in revenue to USD 220-240 million (NASSCOM, 2006c).

Professional radiological services, on the other side of the skill continuum, offer an “extreme” case¹⁷ of offshoring because of the high degree of technical knowledge required combined with the potentially harmful effects of making mistakes, which can result in misdiagnosis of life threatening conditions (F. Levy & Yu, 2006).

This study produces detailed case analyses of four firms. Case-based research strategies are particularly well suited in helping a researcher retain the holistic characteristics of events, such as organizational and managerial processes (Yin, 2002). Cases also regularly imply analytical generalizations and they can serve as the foundation of theory formation (Weiss, 1994). The firms selected for this study were chosen for their longevity and their market leadership in the knowledge process outsourcing industry (See Table 1.2: Summary View of Medical Service Firm & Table 1.3: Summary View of Financial Service Firm). The firms Infosys and Evalueserve specialize in financial services. Teleradiology Solutions and the Global Radiology Centre (GRC) are firms that specialize in radiological services. Infosys, founded in 1981, is a top 10 IT and ITES firms in India in terms of revenue (Dataquest, 2010), has over 100,000 employees worldwide, and is perhaps the firm most closely identified with India’s IT and ITES revolution. While the majority of Infosys’ revenue is derived from software services, the company’s acquisition of leading Business Process Outsourcing (BPO) firm Progeon in 2006 positioned Infosys as a top ten leader in IT enabled services (Dataquest, 2010) and later in knowledge process outsourcing services. Evalueserve, on the other hand, was one

¹⁷ Radiology is an “extreme” case in terms of its skill and educational demands, relative to the low-skill, back office work that dominated offshore outsourcing in India in its early years.

of the first “pure” knowledge process outsourcing firms; indeed, the firm coined the term in order to differentiate its “knowledge intensive” services from the lower skill level call center and data entry work that defined the early years of offshore services in India. Evalueserve was founded in 2000 and has over 2200 employees working on various services, including investment and patent research. Financial services generate 70 percent of revenue in Infosys’s knowledge services division and 40 percent of the total revenue for Evalueserve (personal interviews, Infosys, 11/23/07 & Evalueserve, 12/3/08).

International teleradiology is a relatively small niche service industry and the Global Radiology Center (GRC) and Teleradiology Solutions are the longest running firms providing these services from India (Chandran, 2008). The GRC was founded in 2002 as a joint venture between top 10 IT and ITES company, Wipro, and a regional hospital group, Manipal Hospitals, and has approximately 22 employees. Teleradiology Solutions was founded in 2001 and has approximately 350 employees. Evalueserve and Teleradiology Solutions focus on slightly more specialized services relative to Infosys and GRC. The former firms were traditional start-ups, while the Infosys knowledge services division and the GRC were either acquired or incubated by established IT firms looking to diversify into new lucrative service lines.

VIII. Method

This analysis will draw upon three types of primary source data (interviews, observation, and documents) as well as secondary sources in order to explain the processes at work leading to industrial upgrading into knowledge intensive service delivery. Of these, the interviews provide the core foundation of the data collection

strategy. The dissertation draws upon 101 semi-structured interviews collected during 14 months of field research in India, conducted between July 2006 and May 2009 as well as subsequent follow up phone interviews. Interviews targeted Indian executives, managers, workers, employee development training staff, governmental and trade association officials, clients, and western executives responsible for offshoring operations at multinational companies. The study also draws upon ethnographic observations gathered during visits to dedicated training facilities,¹⁸ industry policy meetings, and industry trade events and conferences.

The research also draws upon primary source documents from the Government of India, trade associations, newspapers, trade publications and magazines, as well as secondary sources in order to complement and corroborate interviews data where possible. I focused my investigation on 5 news sources (International sources: *The New York Times*, BBC.co.uk; Indian sources: *The Hindu*, *The Times of India*, and *The Deccan Herald*.) using key search terms and electronic alerts.

I also performed follow up interviews and searches in newspapers, after the emergence of the global financial crisis in September 2008. The destabilization of the global financial system and the collapse of investment banks that bought financial services from Indian companies raised concerns over the long-term sustainability of offshore outsourcing concentrated in financial services. In the short-term, financial executives responded to the uncertain economic climate by delaying purchases and service commitments, causing sales to drop for many Indian companies that provided these services. Overall, the broader ITES industry growth, dominated by lower value

¹⁸ The GRC does not have a dedicated training facility because of its small size and reliance on a one-on-one training model, although some “soft-skills” and management trainings are offered through Wipro, the parent organization.

back office services, stagnated during the crisis and then quickly rebounded. Growth in the higher-value KPO sector dipped causing analysts to revise revenue growth forecasts in India from 16.7 billion in 2010-11 to 17 billion in 2013-14 (Aggarwal, 2010a). The reason was that many firms were fighting to survive and lower-value cost cutting BPO services could help companies cut costs, after they moved beyond the initial fear of approving new deals in the face of such economic uncertainty. KPO services on the other hand are typically value-adding activities that provide additional analysis of data and are used to help guide future company strategy. Value adding activities were simply not on the agenda for many companies in survival mode.¹⁹

IX. Plan of the Dissertation

In the dissertation that follows I provide a brief overview of the Indian state's post-Independence developmental trajectory. This history is briefly sketched in Chapter 2 "The Indian Developmental State: Interventions in IT& Higher Education Policy." In this chapter I analyze the state's successes and failures in building a knowledge base for industry development through an analysis of the Indian higher educational system and key industrial policies that helped the sector emerge and upgrade. In Chapter 3, "In Partnership with the State," I analyze the evolving role industry trade associations' play fostering development in the Indian IT and ITES industry. This new arrangement is helping to address some of the limitations of the Indian state, such as the under production of skilled workers in the higher education system relative to industrial needs. In Chapter 4, "Skill Upgrading through Client Relationships & Migration of Technical

¹⁹ Neither Infosys nor Evalueserve had banking customers who failed (i.e. Lehman Brothers), although they were affected by the overall market turmoil that lowered short-term industry growth rates across the board in the banking and financial services sector.

Labor” I analyze the organizational practices that transfer knowledge from developed countries to service providers in India. I uncover two central mechanisms, one that transfers knowledge through client relationships and another that occurs through the migration of technical labor. Chapter 5, “Firm Training Programs: The Construction of Upgrading in Offshore Service Companies” focuses on the ways in which firm training programs upgrade worker skills and build firm knowledge. Simultaneously these efforts shape the perceptions of firm capabilities, thereby highlighting the constructed nature of skill upgrading. In Chapter 6, I shift the analysis from the meso-industrial level of analysis to the micro foundations of India’s industrial upgrading story, with a particular focus on the new cultural capabilities embodied in the worker. I argue, the performance of “cultural labor” is imperative to firm success in the international trade of services. I conclude (Chapter 7) by arguing that the new institutional arrangement guiding development, led by industry associations in partnership with the state, in the IT and ITES industry is emblematic of India’s new approach to development and is being replicated unevenly across other industrial sectors in India and in other developing country contexts. In the conclusion I also assess how the mechanisms identified here can inform policy and the opportunities other developing countries have in replicating India’s ITES industrial strategy.

Table 1.2: Summary View of Medical Service Firms

Industry	Less Specialized*	More Specialized
Medical	<p data-bbox="456 304 818 373"><u>Global Radiology Center</u> (Wipro + Manipal Hospital)</p> <p data-bbox="456 411 862 590">Origin/Type: Incubation (est. in 2002) between business house, Wipro (est. 1945. IT: 1980), and Manipal Group (est. 1990).</p> <p data-bbox="456 630 878 737">Employees: 22 total, 5 Indian certified doctors and 4+ full time technologists</p> <p data-bbox="456 777 870 1136">Focus on 3-D Imaging for US Market. Provide Indian certified radiologists for 3-D imaging, which are more highly educated and less expensive on average than technologists used in US. Also provide interpretations of images for Singapore based clients using Indian radiologists (less than 20% of revenue).</p> <p data-bbox="456 1176 862 1421">Model: IT service company, Wipro, partnered with Manipal Hospital, in a revenue sharing model that combines the management and delivery skills with technical expertise of respective organizations.</p>	<p data-bbox="911 304 1230 333"><u>Teleradiology Solutions</u></p> <p data-bbox="911 411 1317 480">Origin/Type: Entrepreneurial firm (est. 2002)</p> <p data-bbox="911 520 1382 590">Employees: 350 total, 13+ US board certified doctors</p> <p data-bbox="911 630 1430 842">Focus on top value services: “reporting” or reads of scans by qualified US Board Certified radiologists working overseas. Also deliver 3D work, clinical trails, and other service lines to US, Singapore, and Indian markets.</p> <p data-bbox="911 882 1430 1211">Model: began as a Yale faculty / US Board certified radiologists (ABR) performing radiology reads from house in India. Grew business over time, hiring additional US board certified radiologists – wherever they may live – to provide diagnostic interpretations for US clients through secure technology network.</p>

* Specialization is defined in terms of the degree of interpretation and customization required for work. If work tends to be more routinized, less tailored and customized, it is therefore less specialized. The degree of industry skill and knowledge tends to increase specialization.

Table 1.3: Summary View of Financial Service Firms

Industry	Less Specialized	More Specialized
Finance	<p><u>Infosys BPO, Knowledge Services Division</u></p> <p>Origin/Type: Acquisition (Progeon est. 2002, acquired by Infosys 2006) by leading IT firm (Infosys est. 1981). Knowledge service work started in 2005.</p> <ul style="list-style-type: none"> • 1000+ highly skilled professionals, including Chartered Accountants, MBAs, engineers, statisticians and economics graduates • Focus: Large, process oriented engagements that build upon firm’s core IT and BPO business. <p>Model - grew out of BPO processes into higher-level work as client’s confidence in skills increased.</p>	<p><u>Evalueserve</u></p> <p>Origin/Type: Entrepreneurial firm (est. 2000)</p> <ul style="list-style-type: none"> • Largest KPO in world • 2200 highly skilled professionals MBAs, Chartered Accountants, PhDs, and lawyers. • Focus: Small, specialized/ customized engagements. Provides a range of custom research, data analytics and Intellectual Property and Legal Process Services <p>Financial Services</p> <ul style="list-style-type: none"> • Asset Management • Private Equity • Investment Research • Retail Banking • Insurance <p>Model – Highly customized research & consulting work that provides 70-80% of tasks traditional performed by investment bank/ consulting companies.</p>

Chapter 2

The Aspiring Developmental State

I. Introduction

The Indian state has slowly shifted development strategies from a developmental state led-model to one that is more fragmented and industry led. This shift began to unfold during the early to mid-1980s, with an opening up of policy reforms, but was accelerated and coordinated through the help of trade associations beginning in 1988. Even as these changes have taken place, the initial role of the Indian state and the continued role of the state in partnership with trade associations and other entities remain important to an overall understanding of Indian development. In the context of the shifts described above, this chapter will focus on the role the state played in establishing the industrial knowledge base, policy coordination, and support for subsequent upgrading.

According to Peter Evans (1995), Indian development in IT was characterized by a lack of public-private coordination. While this describes the state-industry relationship until the early 1980s, this began to change to such an extent during the 1980s and 1990s that by 2000 industry and trade associations were key actors in IT and ITES industry policy and, by mid-2000s Public-Private Partnerships (PPP) were becoming the preferred developmental model. These initiatives were increasingly coordinated and driven through trade associations. There are two underlying factors that caused this change. First, there was a shift in the role of the state from autarky to embeddedness in civil society, which is characterized by close ties to the business community (Evans, 1995). Second, was the rise

and consolidation of the industry association, the National Associations of Software and Service Companies (NASSCOM), to speak and act on behalf of the industry.

Contrary to popular and industry perception, the Indian state helped to support the emergence of the country's software and services industries. The commonly repeated narrative by IT and ITES insiders is that the industry developed, not because of government support, but in spite of it.²⁰ This narrative, however, neglects three important factors that helped the industry emerge, grow, and eventually upgrade to higher value services. The first was the significant investments the state made in building educational institutions that provided the IT industry with the educational foundation to enable growth and subsequent upgrading. The second oversight is the actual IT policies and programs that the Indian state implemented beginning in 1972 that helped the IT and ITES industries take off and upgrade. Third, it neglects the intervention the state made to discourage continued market dominance by foreign MNCs, best exemplified by the exit of IBM in 1978, which provided emerging domestic producers the opportunity to develop without being overrun by foreign competitors in the late 1970s and early 1980s.

This chapter provides an overview of key economic, political and institutional developments in India contributing to the rise of the ITES industry. First, I analyze the macro-context for the Indian development state since Independence, highlighting along the way key industrial policy initiatives that helped the IT and ITES industries grow. Second, I focus on state formation of a higher educational system that provides the foundation for IT and ITES industry development. In doing so, I challenge 3 commonly held assumptions about development in India. These assumptions are:

²⁰ For arguments that highlight the role of the state played in supporting the emergence of the IT industry see (Evans, 1995; Heeks, 1996; Pingle, 1999)

1. *The economic turnaround of the Indian economy (as measured by GDP) was the result of economic liberalization.* I find instead that a shift in the role of the state was more important, and predated, the large economic reforms of the 1990s.
2. *The software and ITES industries flourished precisely because the state was uninvolved in these industries.* I find that, in fact, the state implemented a 1972 IT policy and became increasingly involved in promoting the software industry and the ITES industry that followed, due to its interaction with industry.
3. *The higher education system is responsible for India's success OR its failure.* I find that the answer is somewhere in the middle of these two extremes. The state initiated educational system provided a foundation for industry development, but that base was insufficient to meet growing industry demands and the government required new efforts and policies, with the help of industry, to meet growing industry needs.

Given these three challenges to popular and academic narrative of India's IT and ITES industry development, this chapter challenges claims that ITES industries flourished because of state lack of involvement. Instead, I provide evidence that the state was not only involved, but its involvement was key to the take-off and maturation of the sector. Yet, the state alone was unable to meet the industry's evolving needs, requiring various forms of industry input. (Chapter 3 provides a closer examination of the new actors that assisted the state in this process). First, I turn to the economic and political history in order to provide the institutional context for further analysis of the IT enabled service

industry. Then I survey the expansion of the higher educational system, with a particular eye toward the interaction of the state and non-state actors in educational policy reform and the creation of new technical intuitions.

II. Shifting roles of the Indian Developmental State

At the time of independence, India sought to become a self-sufficient developmental state. Yet, the state's attempts to achieve its own *developmental goals* failed (Bagchi, 2000; Chibber, 2004; Herring, 1999) or met with mixed results (Evans, 1995). The general conclusion in the literature is that the Indian state is committed to planning, yet too democratic, soft and embedded to govern the market (Herring, 1999). Yet, this characterization fits a specific historical period when India's "Hindu rate of growth" averaged between 3 and 4 percent, prior to its economic turnaround in the mid-1980s.

In subsequent years India experienced a dramatic economic turnaround. Its broader economic growth rates of 6 percent or higher since the late 1980s and since the early 1990s the rates have ranged between 6 to nearly 9 percent of GDP (Panagariya, 2008). These high growth rates have made a visible impact on the country, particularly in urban centers where commerce and development are most highly concentrated. The economic reforms that followed India's balance of payment crisis in 1990-91 are offered as a common sense explanation for India's economic turnaround, but some scholars have challenged this assertion (DeLong, 2003; Kohli, 2004; Panagariya, 2008).²¹ The antecedents of this dynamic shift in overall economic performance require further scrutiny. In order to highlight the political and economic developments that shaped

²¹ For an overview of the debates on the causes and effect of Indian economic reform refer to (Corbridge & Harriss, 2000; Joshi & Little, 1996).

overall industrialization since independence, I will use the economic periodization and growth rate estimates provided by Panagariya (2008), which are provided in Table 2.1 and Tables 2.2 below.

Table 2.1: State Roles and Associated Growth Rate

State Role	Year Range	Growth Rate %
Emergent Developmental State	1951-1965	4.1
License Raj State	1965-1981	3.2
Pro-Business State Attitude	1981-1988	4.8
Association Led Developmental State	1988-2006	6.3

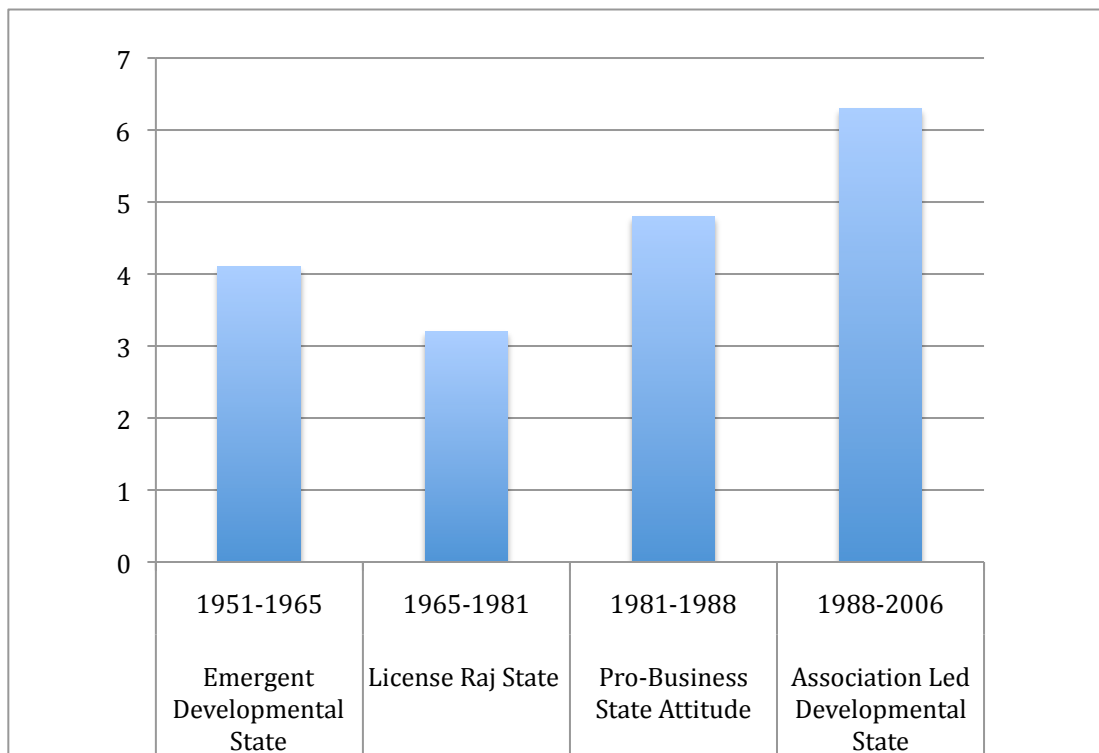


Table 2.2: Bar Graph of State Roles and Associated Growth Rate.

X-axis is the economic and political phase of growth with corresponding date range. The Y-axis is growth rate percentage based on price adjusted GDP. Source: Based on calculations in (Panagariya, 2008, p. 7).

I argue that the state's role shifted in response to internal and external constraints, which shaped the four distinct economic outcomes provided in the graph above. Each role was characterized by a distinctive approach to development and different economic outcomes. I characterize the varying roles of the state over specific periods of time as: The Emergent Developmental State (1947 to 1965); The "License Raj" State (1965-1981); Pro-Business State Attitude (1981-1988); and the Association Led Developmental State (1988-2010).²² I will describe each of these state roles below, concentrating most heavily upon the latter stages, which most directly affect upgrading in the IT and ITES sectors that is the focus of this dissertation. This analysis of the Association Led Developmental State will continue in Chapter 3, which focuses on developmental role trade associations play in industry growth and upgrading.

i. The Emergent Developmental State (1947 to 1965)

The Emergent Developmental State, which lasted from Independence in 1947 to 1964, was characterized by the state's desire to become self-sufficient in the wake of colonial domination. This self-sufficiency was sought through an import substitution industrialization (ISI) developmental strategy and state investments in strategic industries and in education. Despite the state's inability to create a "strong developmental state" during this early period (Chibber, 2004), the newly independent Indian state achieved self-sufficiency and industrial diversification during its first three industrial plans (1951-66)(Rudolph & Rudolph, 1987). This period achieved an average annual growth rate of 4.1 percent (Panagariya, 2008). Most significantly for later development, state action

²² Although Panagariya's calculations stop at 2006, I am extending the period associated with the Association Led Developmental State role to 2010, since growth rates from 2006-2010 were in excess of the average 6.3% associated with this period and the state role has become even more reliant on industry associations.

during this period led to deepening of India's industrial and technical base (Chibber, 2004).

During this period, the state created a number of state-owned enterprises that helped develop technical manufacturing industries in cities that would later become IT hubs. In particular, the establishment of large public sector units in Bangalore by the state helped develop an emerging technical talent pool in the area that would foster subsequent industry development (Personal Interview, Secretary to Karnataka Government, 11/15/07). The key public sector units headquartered in Bangalore include Hindustan Aeronautical, Ltd. (HAL) (established in 1940); Hindustan Machine Tools, Ltd. (HMT) (1953); Bharat Electronics, Ltd. (BEL) (1954); and Bharat Earth Movers, Ltd. (BEML) (1964). The concentration of state owned enterprises, along with the creation of leading universities in the Bangalore area (such as the Indian Institute of Science) helps explain how Bangalore, in a less than a generation, was transformed from a relatively small city, known as "a pensioner's paradise," into India's "Silicon Valley." Bangalore became a thriving IT and ITES hub city of 5.7 million commanding half of the state's gross domestic product income derived from the services sector (Business India Intelligence, 2011). One of the major developmental accomplishments of the state during this period was the educational system, which provided a base for subsequent industrial growth and upgrading. I describe the state's interventions in the higher educational field in greater detail in the second half of this chapter.

ii. *The "License Raj" State (1965-1981)*

This period is most strongly associated with the leadership of Indira Gandhi (1966-1977), the suspension of India Democracy (i.e. "Emergency") from 1975-77, and the peak of government regulatory control of industry. During this period the State

viewed the business community as an object to be controlled rather than supported and promoted. This gave way to onerous regulations that made it difficult for many firms to operate. Licensing for industrial entry or expansion was first established under the “Industrial Development and Regulation Act of 1951” and substantially expanded under “The 1969 Monopolies and Restrictive Trade Practices (MRTP) Act.” The MRTP attempted to reserve licenses for small and public sector producers and make it more difficult for large companies to enter certain industries (Heeks, 1996). But the regulation regime actually had the unintended consequence of harming small-scale businesses more than large-scale business, since the latter had the resources and the political ties required to bribe bureaucrats and circumnavigate bureaucratic rules (Chibber, 2004). Despite regulatory difficulties for businesses, the roots of the current economic success in the IT and ITES industry can be traced to this period. The government implemented policies that provided Indian firms with an opportunity to enter the IT market. It was during this period that the government of India first identified IT as a sector worthy of government support, crafted an IT policy, and limited foreign MNC dominance in the IT market; this allowed some of the leading IT companies to emerge in the late 1970s and early 1980s. These developments are discussed in greater detail under Section III on IT policy and firm emergence in this chapter.

iii. Pro-Business State Attitude (1981-1988)

I argue that a key explanation for the rise in economic prosperity in India was a change in the role of the state to become more pro-business during the 1980s. This explanation runs counter to neoliberal explanations that emphasize a roll back of the state, through far reaching liberalization market reforms, which are credited with helping

India to move away from its “Hindu rate of growth.” One exuberant commentator providing such an account says,

[...]in July 1991[...] with the announcement of sweeping liberalization [...] [W]e felt as though our second independence had arrived: we were going to be free from a rapacious and domineering state... (Das, 2002, p. x).

Tarun Das, the Director General for 30 years of the national business association, the Confederation of Indian Industry (CII), also credited the 1991 liberalization reforms with India’s economic growth in an interview with Thomas Friedman:

'Our Berlin Wall fell,' said Das, 'and it was like unleashing a caged tiger. Trade controls were abolished. We were always at 3 percent growth, the so-called Hindu rate of growth—slow, cautious, and conservative. To make [better returns], you had to go to America. Well, three years later [after the 1991 reforms] we were at 7 percent rate of growth (Friedman 2005, p. 50).

Explanations of this kind are overdrawn and fail to grasp both the timing and cause of India’s economic growth and the scope of reform. Social scientists have highlighted the fact that India’s economic turnaround occurred well before the bigger and more visible reforms during the 1990s (DeLong, 2003; Kohli, 2004; Panagariya, 2008). These accounts suggest that the policy officials’ ideological shifts toward more “business friendly” approaches to governance did more than the actual economic policy changes to spur higher economic growth rates. This argument follows Rodrik and Subramanian’s distinction between “premarket” and “probusiness” orientations, where the former focuses on removing impediments to markets through economic liberalization, which favor new entrants and consumers, and the latter with focuses on raising the profitability of the established industrial and commercial establishments, favoring incumbents and producers (Rodrik & Subramanian, 2005, p. 195).²³ In a similar vein, Atul Kohli argues

²³ Other scholars who credit the shifting attitude of the state for the economic growth of the 1980s, rather than simply economic liberalization include (DeLong, 2003; Kohli, 2004). This argument runs counter to

that the left leaning officially socialist state experienced a “pro-business drift” beginning in the 1980s that helped produce more cohesive state policy, but he attributes this change to the state’s decline in multiclass representation, rather than neoliberal policy reform (Kohli, 2004, p. 278). This shift by the state during the mid-1980s encouraged, rather than discouraged, entrepreneurial activities and promoted integration into the world economy, leading to a belief that the “rules of the game” had changed (DeLong, 2003). The marked effects of these shifts in *state policy* undercut the neoliberal explanation of India’s growth as being produced by reforms to minimize government intervention in the market.

The increasingly pro-business stance of the Indian state began under Indira Gandhi’s return to power (1980-1984), but is most strongly associated with the leadership of her son Rajiv Gandhi (1984-1989).²⁴ His government implemented policy reforms that encouraged capital-goods imports, relaxed industrial regulations and rationalized the tax system (DeLong, 2003). Policy liberalizations in the area of state control included delicensing of entry in some industries, reduction in the scope of MRTP Act, greater leeway in firm expansion without license renewal, a greater degree of flexibility in producing alternative products without license renewals, reduction of price controls on some goods, and lowering of corporate taxes (Heeks, 1996, p. 36). Yet, the reforms tended toward reduction of governmental oversight and regulation, rather than the removal of governmental oversight and regulation as neoliberalism would suggest.

iv. *Association Led Developmental State (1988-2010)*

the arguments of economists who attribute liberalization reform, rather than a change in state attitude, as explanations for growth. See Panagariya (2008) and (Srinivasan, 2005).

²⁴ For a more nuanced rendering of the three phases *within* Rajiv Gandhi’s administration see (Kohli, 1989)

During this period the state continued to build ties with industry, giving its agents more autonomy and authority over the developmental process. However, changes in state-society relations occurred unevenly across industrial sectors. Factors contributing to this variance in state action by industry are average firm size, the strength of the trade associations, the industries export orientation and potential, and the presence of unions. The IT and ITES industries were more prone to cooperative ties to the state than other, domestically oriented manufacturing industries. This was because the software and services industry in India is dominated by small, resource poor firms that are strongly export oriented, with a cohesive and proactive trade association with linkages to the state (Pingle, 1999), and has no sizeable organized union. The state's continued move to the right and its embrace of economic liberalization, which is particularly pronounced in the software and service industry, does not mean that the state was uninvolved in promoting this sector. It just took on an increasingly supporting role in the development process.

There are number of state policies that have helped the sector grow over time. For example, the state passed legislation that provided a number of financial incentives, including state tax exemptions on profits from software exports, discounted rates on utilities for firms, and infrastructure improvements of special export processing zones dedicated for the industry in IT hub cities (NASSCOM, 2006a; Pingle, 1999). The sector has also actively and increasingly engaged government. Over time, these relations have become formalized into Public-Private Partnerships (PPP) replicated across industries and developmental projects; trade associations, as I discuss in Chapter 3, play a key role in forging industry relationships with the state. PPPs were also facilitated the development of new industrial facilities and the creation of new technical colleges. These

projects are also discussed in greater detail in Chapter 3.

III. Policy Frameworks and the Emergence of Firms

The Indian state created IT policies and programs that helped the Indian software industry grow and upgrade over time. The policy framework emerged in a patchwork manner, incoherent during the 1970s and 1980s, but was increasingly refined during the 1990s, as the state worked more cooperatively with industry and its associations. India has had a software policy since 1972, longer than any other developing country (Heeks, 1996, p. 25; Parthasarathi & Joseph, 2004).

i. The Development of India's IT Policies

The Department of Electronics (DoE), founded in the 1972, was responsible for the software industry and software industrial policy. That same year the DoE launched the “Software Export Scheme” policy, which provided software exporters an exemption from paying import tariffs on IT hardware if the computers were used for the development of software for export markets. In order to qualify for the duty exemption the importer needed to commit to earning the import price of the computer in foreign exchange through software exports within a five-year period.²⁵ This law was first used in 1974 and benefitted early software companies, such as Tata Consulting Services (TCS) and Infosys. Prior to 1980, however, most software companies were using the “Software Export Scheme” to lease computer equipment for domestic use, rather than the production of software for exports (Heeks, 1996, p. 43). The state attempted to discourage these practices through adjustments to the policy, such as increasing the minimum threshold of export revenue generated, but its success was mixed at best. The

²⁵ The commitment was later raised to twice the import price (Heeks, 1996, p. 42).

policy efforts made during the 1970s helped build a foundation for the software industry, but more sustained and coherent software industrial policy only emerged in 1985 when software was identified as a thrust area by the government (Heeks, 1996, p. 25) (See Table 2.5: Major Milestones and Events in Indian IT Industry). This lack of focus of the government on software policy was due in part to the biases of the state toward hardware manufacturing and toward the domestic, rather than the export market.

State promotion of and intervention into the software industry, however, operated within a broader Indian industrial policy orientation that privileged domestic producers over foreign producers. The overall import substitution industrialization (ISI) model of development, which guided industrialization within India, also influenced state intervention in the electronics industry. The recommendation of the Bhabha Committee Report on Electronics (Government of India, 1966) prompted the state to shift electronics production away from foreign firms toward domestic ones and to upgrade technology in the state. Policy makers viewed multinational hardware manufacturers as taking advantage of India and dominating industry during the 1960s. With this in mind and the subsequent Bhabha Report recommendations, the state focused attention on getting the wholly owned multinational subsidiaries to dilute their equity by passing Foreign Exchange Regulation Act (FERA), in 1973, which required all foreign firms to dilute their equity (Evans, 1995; Pingle, 1999). Yet the complete domination of MNCs in the Indian market made enforcement difficult for the state and firms, such as IBM, were able to resist state regulation for a number of years (Heeks, 1996, p. 55). The peak in government control of the computer industry lasted from 1976 to 1978 (Heeks, 1996, 56), which coincides with the peak in regulatory role of the “License Raj” state.

During the 1980s Rajiv Gandhi began to repair ties with the broader business community, which were harmed during the License Raj period, and with the IT sector specifically. Rajiv Gandhi was a proponent of IT and sought to promote the sector and technology within the country more generally. It was during this period that Indian policy in IT shifted toward a promotional role. The state began to put together the institutional framework to more substantively support industry (Evans, 1995). The more comprehensive software policy implemented in 1986 was a crucial component of this shift. The policy delinked the software industry from the hardware sector. Previous policies grouped hardware and software together, despite their different market orientations, industry maturities, and requirements.

A crucial policy identified by industry insiders and scholars that enabled industry's emergence and later growth was the creation of infrastructure and export processing free trade zones set up exclusively for software and service companies.²⁶ In 1988 a Software Technology Parks (STP) of India Scheme was established under the Department of Electronics. The STP initiative provides a number of tax exemptions, such as a 100% income tax exemption on export income during the first 5 years of operation, a 50% exemption thereafter, and exemptions from central and state sales and service taxes (Software Technology Parks of India, 2011). The STP scheme was passed during a the more Pro-business orientation of the state, but was only implemented 3 years later, after gaining some additional input from industry and its association.

The STP scheme was not an absence of government intervention, but rather an intensification of government involvement to support industry. The Software Technology

²⁶ Multiple industry executives at Infosys and Evalueserve and government officials at STPI, and state and federal departments. Also see (Athreye, 2005; Kennedy & Sharma, 2009)

Parks of India (STPI) was an agency established by the government in 1991 in order to implement the STP Scheme and expand the initiative in regional hubs across the country. A crucial government service provided by STPI was the provisioning of communication infrastructure, such as data communication infrastructure, bandwidth, and satellites, which were particularly difficult for companies to obtain even as late as the early 2000s. Another role STPI played beginning in 1991 was coordinating with other state agencies in order to provide a “single window clearance.” STPI, in conjunction with state IT departments, helped facilitate interaction with government agencies and departments, such as the customs department, labor department, industries department, sales tax authority department, and airport authorities (personal interviews, government official, Department of IT, Karnataka, 11/12/07; Director, STPI-Bangalore, 11/7/08). While, some industry members complained, even as late as 2008, that in practice there was no “single window;” firms still had to coordinate with multiple governmental agencies (Executive, Infosys, 12/10/08), STPI still helped to streamline the approval and coordination process to make it less onerous and lengthy. By 2006 procuring business data lines and Internet access in the metropolitan areas became easier for firms and STPI shifted its focus to incubation services targeting small start up businesses with fully equipped office suites and connections to venture capital funders (Director, STPI-Bangalore, 11/7/08). STPI also helped provide other services like technology assessment and professional training to support operations. The STPI services provided by the government show an extension of the arms of the state into civil society in order to support business needs, rather than a pulling back or roll back of the state.

During the 1990s state governments joined the central government in enacting IT policies in order to promote software. The focus generally was on key issues of infrastructure, electronic governance, IT education and provision of a facilitating environment (Parthasarathi & Joseph, 2004). Additional IT policies and government promotional initiatives, such as abolition of entry barriers for foreign companies, telecommunications and Internet infrastructure improvements, reductions of taxes, duties, and tariffs are discussed in greater detail in Chapter 3.

ii. The Emergency of Industry

A quarter of the top 20 IT firms in 2010 were established or began operations in India during the “License Raj” period. The firms that were founded in 1981 or before were Tata Consulting Services (TCS) (1968), HCL Infosystems (1976), Patni Computer Systems (1978), Wipro (1980), Infosys (1981), and Microsoft (India)(1981) (See Table 2.3: Top 20 IT and ITES Firms with Operations in India). Infosys, Patni, and HCL were pure start up companies that began with a small number of employees. Patni and Infosys had 5 or fewer employees when founded. TCS is part of the larger Tata Group, founded in 1868 and Wipro was an small investment house that started as vegetable oil company in 1945; both were part of larger diversified companies that later moved into IT toward the end of the License Raj period.

Table 2.3: Top 20 IT and ITES Firms with Operations in India

2010 Top 20 IT Firms in India			2010 Top 20 BPO Firms in India		
Rank	Firm	Began IT work*	Rank	Firm	Began ITES work**
1	Tata Consulting Services (TCS)	1968	1	Genpact	1997
2	Wipro	1980	2	TCS BPO	2004
3	Infosys Technologies	1981	3	Wipro BPO	2000
4	Hewlett-Packard (India)	1989	4	Aegis BPO****	1985
5	Cognizant Technology Solutions	1994	5	WNS Global Services	1996
6	IBM (India)***	1992	6	Firstsource Solutions	2001
7	HCL Infosystems	1976	7	IBM Daksh	1999
8	HCL Technologies	1991	8	Aditya Birla Minacs	1999
9	Ingram Micro (India)	1996	9	Infosys BPO	1991
10	Redington India	1993	10	Accenture (India)	2000
11	Oracle India	1993	11	HCL BPO	2001
12	Cisco Systems (India)	1995	12	EXL Services	1999
13	Dell (India)	2000	13	Xchanging India	2001
14	Intel (India)	1988	14	Cognizant BPO****	1994
15	Accenture India	1987	15	Convergys India	2001
16	Tech Mahindra	1986	16	3i Infotech	1999
17	SAP (India)	1996	17	Intelenet Global	2000
18	Mphasis	1992	18	Hinduja Global Solutions	1995
19	Microsoft (India)	1981	19	24/7 Customer	2000
20	Patni Computer Systems	1978	20	Mphasis BPO	2000

Source: Dataquest 2010

Notes:

Bold denotes ownership overlap between top ITES and IT firms. The considerable overlap among market leaders between these two industry segments underscores the difficulty in analytically separating ITES from the IT industry.

*Date reflects when company began IT services in India. Founding date may be an earlier date.

**Year organization began providing BPO services or date of key BPO firm acquisition, unless otherwise noted.

***IBM operated within India from 1963-1978, but left due to Government pressure to divest.

****Date refers to incorporation date, rather than the date BPO delivery began. That later date could not be found.

A notable exception in Table 2.3, however, is the case of IBM. IBM began operations in India in the mid-1960s, but left in 1978 when the company refused to

comply with the 1973 FERA regulations, which required all foreign firms to dilute their equity (Evans, 1995; Pingle, 1999). The government of India wanted to stimulate domestic production of an IT industry and sought self-reliance that was consistent with its broader ISI developmental strategy at the time. The departure of IBM from India in 1978, however, provided a market opening for domestic producers, which seized the opportunity to develop in the technology arena without the pressures of foreign domination in the domestic market. According to Wipro CEO, Azim Premji, IBM's departure gave India an opportunity to develop its own firms and technologies:

I think it [IBM's exit] gave us a huge opportunity. And I think it benefitted the Indian industry and population enormously because IBM at that time was not bringing in current technology. That was a bone of contention between them and the government of India in the late 70s. And when they exited – because they believed at the time that the world cannot exist without IBM and they had a dominant market share in India – it opened up a huge opportunity for Indian companies to really strike out. It opened a huge market for us to identify a position in this market, which we could create a uniqueness for (Rose, 2006, minutes 1:59 – 2:48 on audio program).

The fact that Premji cites the exit of IBM from India as providing the opportunity to local firms is important to note, particularly because the company's exit was due to government regulatory and protectionist policies. In essence, Premji is crediting government protectionist policies with providing domestic producers the opportunity to grow in the IT sector. Contra the neoliberal explanation of growth, it was in fact government protection that gave early domestic firms the chance to flourish.

IV. In Pursuit of Saraswati: Culture, Status, and Knowledge in India

The foregoing analysis of government policy helps to shed light on how the Indian state has in fact played a critical role in fuelling the development of the IT

industry. In addition to the policy frameworks described above, the state also plays a role in developing knowledge through education. In this section, I explore the context within which the state's higher education initiatives, discussed in section V, have emerged. The development of India's knowledge base cannot be explained by state initiatives to grow educational institutions in the country alone. Instead, the values associated with knowledge in India play an important role in this process. Both the cultural values and status associated with knowledge, particularly in certain fields, have played an important role in fostering the development of knowledge in the country.

At a broad cultural level, reverence of education is celebrated in the Hindu religion. Saraswati is the goddess of knowledge and Hindu citizens across the country pay homage to her through religious rituals.²⁷ The devotion and respect also extends itself to other symbols of knowledge and learning, the most notable of which are books, which are to be kept clean, off the floor, and never touched with the feet, which are dirty and a sign of disrespect. In particular, the country places a strong value on technical education and technical degrees. The technical areas most highly sought after are within the Science, Technology, Engineering, and Mathematics fields (STEM). Of these, engineering is the most popular and it is widely considered the highest status profession in India. This is reflected in the selectivity rating for top engineering colleges relative to other fields. The high status of technical education is even evident in the marriage market. Engineers tend to be highly sought on the marriage market in newspaper advertisements, and on popular marriage websites, such as shaadi.com. After Independence civil engineering was the most popular engineering specialty. With the rise

²⁷ I do not intend to suggest that all Indian Hindus value education nor do I suggest that non-Hindus devalue education. I am simply calling attention to the ways knowledge has deeper cultural roots in the nation.

of IT industries this interest shifted toward computer engineering, which surpassed civil engineering as the most competitive subspecialty.

The status and prestige attributed to science and math education in India stands in contrast to those emphasized in the U.S., where many students gravitate away from STEM subjects.²⁸ According to an Evalueserve executive, “here [in the US] if you study science and math you are called ‘geeks,’ but in India you are called a smart guy . . . you are getting marriage proposals” (personal interview, Evalueserve Executive, 5/22/09). The executive expanded upon this contrast by pointing to the negative effect of American students’ peer groups, who often frown upon those who wanted to pursue interests in the science and math fields, including women (personal interview, Evalueserve, Executive, 5/22/09).

Other Indian industry executives have commented that the reason why India has become such a popular sourcing destination for companies is because the country has the raw production of technical talent that the US lacks. The cultural value of knowledge in technical fields has contributed to the emphasis on these fields in education and the availability of talent in India. According to Wipro CEO, Azim Premji, “education in American has never emphasized math at a primary level, while in India it has always emphasized that” (Rose, 2007). The Premji elaborated that technical fields are very popular in India because students are pushed to excel in them, because of the cultural value attributed to them, and they are motivated to achieve in these fields because they provide the best career options, which is particularly compelling in a developing country context (Rose, 2007).

²⁸ U.S. President Obama’s efforts to reinvigorate interest in science and technology fields and rekindle a “Sputnik” moment when American student’s gravitated toward science fields in the 1960s speaks to this trend. See Obama’s State of the Union address, January 2011.

V. Higher Education and the Development of the IT Industry

Although the cultural foundation that places value on knowledge is an important component of India's successes, it alone is not enough. India would not have become the developing country leader in IT and ITES services without the state's creation of a high quality higher education system capable of providing high numbers of technical talent. State intervention was critical in building a foundational knowledge base that provided the intellectual capital for subsequent industrialization. The state has been fairly successful in generating a top-tier of the higher education system that is capable of serving the needs of industry, producing high quality employable talent. The state's success in education must be qualified in two ways. First, the strengths of the educational system do not sufficiently extend beyond the top tier, leaving a gap in the labor supply available to firms. Second, the country has failed to generate widespread literacy and primary education, which deeply constrains the supply of students that reach the higher educational system.

Despite the recognized strength of the very top tier of higher education a broad consensus stretching across academia, industry and government has emerged that India needs educational reform (Agarwal, 2006; Bhagwati, 1993; Debroy, 2008; Government of India, 2002, 2007a; National Knowledge Commission, 2007; Pitroda, 2008). The country's primary problem in higher education has been its inability to produce a sufficient quantity of quality graduates to meet its own industrial needs. Only about 10 percent of university age students are attending university, while in many other developing countries this figure is closer to 20 to 25 percent (Debroy, 2008). The middle

to low end of the education system fails to meet the country's industrial needs, despite high labor demand (Agarwal, 2006; Panagariya, 2008). The lack of a sufficient labor supply with higher education degrees, particularly in technical fields, such as engineering and computer science, is reflected in overall wage inflation (Panagariya, 2008). Specific problems with the higher educational system, as it relates to the IT and ITES industry, include too few quality teachers and institutions, outdated equipment and curriculum, a lack of real world problem solving skills, creative thinking skills, interactive skills, and cross-cultural sensitivity.

Second, the state's relative success in higher education needs to be viewed alongside its general failure in achieving universal literacy and widespread primary education. The Indian government itself has called this "one of the most disappointing aspects of our developmental strategy," with net attendance in primary level education an unacceptably low 66 percent (Government of India, 2002, section 3.57). India's adult literacy rate is also 66 percent.²⁹ The unwillingness of the state to legislate compulsory primary level education in India, which is seen as oppressive toward the poor who depend on child labor for survival, helps to explain the state's failure to spread primary education (Weiner, 1991). However, the broader state bias toward tertiary education over primary education has roots in the colonial state, which emphasized higher education over primary education and literacy in order to create a cadre of Indians capable of assisting the British Raj in the administration of the colony. After Independence the elitist political leadership in charge of the state, who had received education under the British

²⁹ Adult literacy rate is defined as a percentage of persons aged 15 and over who can read and write (UNICEF, 2003-2008). There is variation across states in terms of literacy rates, with the state of Kerala achieving near universal literacy levels (Sen, 2000).

Raj, also privileged higher education in an effort to industrialize quickly (D'Costa, 2005, p. 59).

Below I identify three major periods in the growth of higher education. These three periods roughly map on to the 4 shifting roles of the state identified above, although the first two periods are collapsed into one period; this difference in organization reflects the state's dominance and success in establishing higher education prior to the 1980s.

i. The Foundation of Higher Education: 1947-1980

The Indian state began creating higher educational institutions immediately in the post-independence period. These efforts built upon the educational infrastructure that the British created to develop its Indian administrative cadre. Prior to independence there were twenty universities and 500 colleges (Panagariya, 2008). This number climbed to 110 universities and 6963 colleges in 1980 (Ministry of Human Resource Development, 2010b). However, the apex in quality education in India is classified as “Institutions of National Importance,” which until the late 1990s were almost exclusively government institutions. The India government helped set up the Indian Institutes of Technology during the 1950s and 1960s, which were designated as “Institutions of National Importance” under The Institutes of Technology Act, 1961 (see education timeline below). In 1961 the first Indian Institute of Management was founded in Calcutta, which produced among the best management and finance professionals in the country. Despite the technical skills base built through state efforts, additional efforts were needed to keep pace with surging education demand.

ii. *Surging educational demand and enrollments: The Rise of Private Colleges: 1980-2000*

The 1980s saw a surge in demand for industry relevant higher education skills, which the state was unprepared to meet (Agarwal, 2006). This situation, along with the more business friendly orientation of the state during this period, prompted the state to allow private enterprise into the arena of higher education. During the 1990s educational demand increased based on growing industry, a rising middle class that increasingly had the means to send more children to higher education. Private institutions met much of this increased demand in higher education (Agarwal, 2006). This trend toward private institutions was particularly pronounced with private engineering colleges, especially in southern states, such as Karnataka, Andhra Pradesh Hyderabad, and Tamil Nadu. The inability of the state to build colleges and universities quickly enough to meet rising industry demand along with deficiencies in quality of graduates produced by the middle to lower levels of higher education lead to a tightening labor market. By the end of the 1990s the situation reached a crisis point. In 1989-99, due to the shortage of engineers in the face of dramatic increases in demand for skilled labor, the government declared a state of “educational emergency” (Athreye, 2005). By 2000 India had established 254 universities and 10152 colleges (Ministry of Human Resource Development, 2010b).

According to an Infosys Executive who claimed he has been active in educational reform for 15 years, “if not for private entrepreneurs in technical education, engineering, we would not have been able to get the people we got” (personal interview, Infosys, 12/10/08). However, despite the rise in the production of raw technical graduates, many private institutions were still unable to produce high quality labor. A new collaboration between the state and industry sought to increase technical labor at this high quality level.

In the late 1990s two technical universities, modeled to approximate the rigor of Indian Institutes of Technology (IIT), were established that would serve as a guide for later efforts to scale technical education in the state. These two institutions were the Indian Institute of Information Technology (IIIT)-Hyderabad in Andhra Pradesh (founded in 1998) and IIIT-Bangalore in Karnataka (founded in 1999). Both of these universities were established as National Public Private Partnerships (NPPP) with financial and administrative governance support provided by both Government of India and the IT industry (Ministry of Human Resource Development, 2010a). However, there were some proto-PPP educational models in India that also served as models, such as the Indian Institute of Science (1909) and the Indian Institute of Management Calcutta (1961) that were universities of national importance that were established through private and state collaborations. The Indian Institute of Science, also known as the “Tata Institute,” was founded with money from Jamsetiji Tata, of the Tata Business House, and the government. The first Indian Institute of Management in Calcutta was a joint venture with the Government of India in collaboration with Alfred P. Sloan School of Management (MIT), the Government of West Bengal, The Ford Foundation, and Indian industry.

iii. Scaling Higher Education through Public Private Partnerships: 2000-2010

At the turn of the century the Indian government increasingly prioritized higher educational reform, vowing to increase the quantity and quality of graduates, in response to growing demands from industry, and the government’s own recognition of the need to increase the supply of labor. The India Vision 2020 Report identifies employment and education as the key thrust areas for India’s future economic growth and specified knowledge, rather than capital, as “the most important determinant of development”

(Gupta, 2002, p. 22). The government also recognized the problems in higher education.

The Tenth Year-Five Year government plan recognized the importance of IT and ITES to the country, but lamented the fall in the quality of higher education in the country:

The University and Higher Education Sector also needs attention. . . it is a matter of serious concern that the expansion in quantity has been accompanied by a fall in quality (Government of India, 2002, p. 38).

The Tenth Year-Five Year Plan identified higher education as needing attention, especially in the area of curriculum and examinations reform (Government of India, 2002). The Plan also recognized that the private sector would play an increasing role in education government called for the modernization of laws, rules, and procedures to enable private individuals and organizations to set up universities colleges and schools (Government of India, 2002, p. 2). During this period there was a big increase in the number of technical and management institutions, primarily due to private initiatives.

The National Knowledge Commission was established in June 13th, 2005 as a high level advisory committee to the Prime Minister of India on educational reform. Prime Minister Manmohan Singh declared, "The time has come to create a second wave of institution building and of excellence in the field of education, research and capability building so that we are better prepared for the 21st century" (Speech at the launch of the Knowledge Commission, New Delhi, 8/2/05). In particular, the Commission was given a "mandate to guide policy and direct reforms, focusing on certain key areas such as education, science and technology, agriculture, industry, e-governance etc" (Government of India, 2010, p. 39).

The panel was composed of eight members, including government officials, academics, and industry executives. Industry representation and leadership were

dominated by the IT industry, however, with two-thirds of industry representation from IT industry and the Chairman of the Commission Sam Pitroda, a leading telecommunications professional who also advised Prime Minister Rajiv Gandhi on telecommunications liberalization in the 1980s. The second IT executive on the Commission was Nandan Nilekani, who was then Infosys' CEO and also previously co-founded industry association NASSCOM. The organization NASSCOM also participated actively in the process, providing industry recommendations, shaping the overall form of the plans proposed. (Chapter 3 will provide more insight into how this organization influenced industry policy with the state). One of the key recommendations coming from the panel was a massive expansion of educational institutions. The panel suggested building around 1500 universities nationwide, which would increase India's enrollment ratio to at least 15 percent (National Knowledge Commission, 2007; Pitroda, 2008). Pitroda and other scholars also identified major problems facing higher education, which included the format and frequency of examinations, which test memory rather than understanding; failure to adapt curricula over time; inadequate research and learning infrastructure, such as libraries, research labs, and Internet connectivity; rising property prices, which have inhibited the growth of universities; and the fact that teachers compensation hasn't kept up with the cost of living (Guha, 2008; Pitroda, 2008).

Policy was created based on the recommendations above and the government's increased recognition of the problems facing higher education. Industry was the major driving force behind these efforts. The Eleventh Five Year Plan (2007-08 to 2011-12) stressed, among other things, an emphasis on building higher level technical and

professional education to support the development of technical education and the IT and ITES industries specifically. In the Eleventh Plan it said,

For India to fully capitalize on the opportunity and sustain its present lead in the global IT/ITES space, there is a need to focus on skill development to enhance the talent pool advantage, strengthening infrastructure to lower the transaction costs of business; and improve the domestic regulatory provisions (Government of India, 2007b, p. 274).

Quality improvement in higher education was initiated through restructuring academic programs to ensure their relevance to modern market demands. There are moves toward a complete revamping of teaching and learning methods, moving away from instruction and rote learning toward interactive processes that encourage creativity and innovation and are based on compulsory seminar-tutorials (Government of India, 2010, p. 36).

The Eleventh Five Year Plan proposed to help meet industry needs by scaling the number of higher education institutions. India had 9653 universities and 18,482 colleges in 2008 (Ministry of Human Resource Development, 2010b). Specifically the Plan proposed to establishment of eight new Indian Institute of Technology, seven new Indian Institutes of Managements, ten new National Institutes of Technology, three Indian Institutes of Science Education and Research, twenty Indian Institute of Informational Technology, and two new School of Planning and Architecture (Government of India, 2007a) (See Table 2.4: Establishment of New Central Higher Education Institutions). The document also states, “the scope for PPPs will be explored” in establishing these institutions (Government of India, 2007a). NASSCOM, the trade association for the IT and ITES industry drafted the plans for the creation of the IIITs (NASSCOM, 2008) that were later adopted by the government of India (Ministry of Human Resource Development, 2010a). What is particularly noteworthy about this process is how the PPP

model went from being an experiment to an explicit policy approach for the government of India. This exemplifies the shift in the state’s role away from autarky toward a state willingness to follow industry’s lead. This ambitious planning process to radically increase the number of technical institutions demonstrates the increasingly complex social initiatives that are being created through the PPP model. It also shows how the state continues to be involved, alongside private actors, in the development planning process.

Table 2.4: Establishment of New Central Higher Education Institutions

Types of Institution	Numbers	
	Existing at the end of Tenth Plan (3/13/2007)	Additional Institutions proposed during Eleventh Plan (2007-2012)
Central Universities	19	16 (in uncovered states) & 14 Innovation Universities*
Indian Institute of Technology	7	8
National Institute of Technology ³⁰	20	10
Indian Institute of Informational Technology	4	20
Indian Institute of Science Education and Research	2	3
Indian Institutes of Management	6	7
School of Planning and Architecture	1	2

* 14 Innovation Universities aiming at world-class standards proposed across Tenth and Eleventh Plan Period.

Source (Government of India, 2010, p. 28, Table 5.1)

³⁰ NITs - National Institute of Technology (established through the National Institutes of Technology Act 2007) (Government of India, 2010)

VI. Conclusion

The development of the IT and ITES industries has been fueled by the Indian state, operating in partnership with other entities. Although neoliberal accounts of India's development have focused on the perceived "rollback" of the state, this chapter has highlighted numerous ways in which the state is indeed heavily involved in industry upgrading and its continued support of industrial development. Instead of withdrawing from the market in order to promote the industries success, the state has instead shifted its role over time. From its role as an aspiring "developmental state," to its role as an "industry-led state," the Indian state continues to be involved in development. The shifts in India's IT related policies demonstrate how the government played a key role in fostering the development of industry by protecting industry from foreign competition and imposing regulations that minimized the dominating presence of foreign companies. This protectionist policy made way for Indian innovation and industry development. Supported by a culture that values knowledge, the state has played a crucial role in the development of a higher educational system that has built the knowledge base for India's IT and ITES industries. However, the state's educational policy has not been unwaveringly successful, as the above analysis shows. Over time it has had to adapt to the gaps in its production of a skilled labor force. The increase of PPPs in the educational sector plays a key role in the state's response.

This chapter has provided an overview of the shifting roles of the state throughout different periods of India's development. The chapter focuses in particular on higher education, where the importance of the state *along with* the growing importance of the private actors (particularly trade associations representing firms) is evident. The

following chapter takes a closer look at the role of these private actors and their partnerships with the state.

Table 2.5: Major Milestones and Events in Indian IT Industry

- 1966 – Bhabha Committee Report on Electronics – seeks to build self-sufficient domestic electronics industry and upgrade technology in the state
- 1969 – The Monopolies and Restrictive Trade Practices (MRTP) Act limits licenses for large companies in an effort to protect small and public sector companies.
- 1972 – Department of Electronics (DoE) founded. IT policy established. DoE implements “Software Export Scheme” allowing hardware to be imported for use in software export work on condition that the price of hardware was recouped within 5 years through foreign exchange earnings.
- 1973 – Foreign Exchange Regulation Act (FERA) limited foreign equity in Indian firms to 40 percent unless the company was solely export oriented. Repealed in 1991 reforms.
- 1976 – Liberalization of policies related to software industry. Faster clearance of software export applications. Software could take advantage of export incentives including location in Export Processing Zones. Non-resident Indians were allowed to import software for purposes of export. Export obligation was 100% of all output produced.
- 1976-1978 – peak in government control of the computer industry.
- 1978 – IBM left India due to failure to comply with Government of India policies concerning foreign ownership liquidity (i.e. FERA)
- 1981 – Software Export Policy: Import duties on hardware raised to encourage use of indigenous computers. Firms allowed to import hardware to write software for both domestic and export purposes. Software exporters could also import ‘loaned’ computers.
- 1982 – DoE initiated a software export promotion policy
- 1984 – New Computer Policy. Establishes software development promotion agency (SDPA) under the DoE. Import procedures simplified. Import duties on hardware reduced from 100% to 60% for software developers. Access to foreign exchange was made easier for software firms. Income tax exemption on net export earnings halved from 100% to 50%.
- 1984 – Policy changes under Rajiv Gandhi prioritize IT sector for growth
- 1985 – Texas Instruments sets up in Bangalore
- 1986 – Software Policy: Indian government identifies education in software as a focal area and was “delinked” from the hardware industry in government policy.
- 1987 – Infosys wins first international client
- 1988 – NASSCOM founded
- 1988 – Software Technology Parks (STPs) of India, Established under the Department of Electronics to encourage and support small software exporters, by giving 100% export-oriented firms a tax-free status for 5 years within the first 8 years of operation. Firms were provided with office space and computer equipment, access to high-speed satellite links and an uninterrupted supply of electricity.
- 1991 – One-year waiver on income tax for software exports passed in government-planning budget
- 1991 – Software Technology Parks of India (STPI) agency established with objective to implement 1988 STP Scheme, set-up and manage communication infrastructure

- facilities, coordinate government approval across multiple state agencies, and technology assessment and professional training services.
- 1992-1995 – Import duties on imported software. Reduced to 20% on applications software and 65% on systems software in 1994. Reduced to 10% on both in 1995.
 - 1993-1999 – Income-tax exemptions: Software exports were exempt from income tax and this tax-free status was confirmed every year till 1995 after which it became open-ended. There is talk of ending this status in 2001.
 - 1994 – General Electric - establishes back office operations in India
 - 1996 – World Network Services (WNS), subsidiary handling British Airways, establishes back office ticketing services operations in India.
 - 1996 – American Express establishes back office operations in India
 - 1996-2000 – Migration of Indian Engineers peaks to developed countries to fix Y2K services, Increase of US H1B visas enable increased technical migration out of India
 - 1997 – Indian IT industry crossed \$1 billion revenue mark
 - 1997-2001 – Peak of global Internet & Telecom boom
 - 2000 – Spectramind, first independent BPO firm founded in India
 - 2001 – 2003 – Global downturn in Internet & telecom industries
 - 2001 – Reduction of H-1B visas in US
 - 2001 – NASSCOM President Dewang Mehta dies
 - 2002 – Spectramind bought by large software firm Wipro
 - 2002 – Progeon, large BPO firm, acquired by Infosys
 - 2002 – By end of 2002 most major IT firms had acquired BPO service company (notable exception TCS - 2004)
 - 2005 – Large Indian firms pass \$1 billion in revenue (TCS, Infosys, Wipro, etc)
 - 2005 – SEZ ACT 2005, Special Economic Zones
 - 2006 - NASSCOM begins Educational Initiative aimed at skills upgrading
 - 2008 - Global financial crisis (stagnant ITES growth rates, decline in KPO growth)
 - 2008 - NASSCOM submits Model DPR document on education to government
 - 2008 - Indian Government support of industry: IT Act Amendment, extension of tax incentives by a year, removal of the SEZ Act anomalies and the introduction of progressive telecom policies that focus on work from home.
 - 2010 – Government of India adopts aspects of NASSCOM education initiative

Table 2.6: Key Institutes of National Importance & Milestones in Higher Education

- 1909 – Indian Institute of Science (IIS) in Bangalore established. Early PPP model founded with Private money under government supervision.
- 1947 – Indian independence & Partition
- 1951 – First Indian Institute of Technology inaugurated (IIT Kharagpur, 1951)
- 1956 – Top medical college in India established, All India Institute of Medical Sciences (AIIMS) in Delhi
- 1958 – Indian Institute of Technology Mumbai
- 1959 – Indian Institute of Technology Chennai
- 1959 – Indian Institute of Technology Kanpur
- 1961 – The Institutes of Technology Act passed (GOI, 1961)
- 1961 – First Indian Institute of Management Calcutta (IIM-C), Established by the Government of India in collaboration with Alfred P. Sloan School of Management (MIT), the Government of West Bengal, The Ford Foundation and Indian industry. Early PPP model.
- 1961 – Indian Institute of Management Ahmedabad (IIM-A)
- 1963 – Indian Institute of Technology Delhi (IIM-D)
- 1973 – Indian Institute of Management Bangalore (IIM-B)
- 1984 – Indian Institute of Management Lucknow (IIM-L)
- 1986 - Government proposal to create four Indian Institutes of Information Technology (IIIT), established only in 1998
- 1994 - IIT Guwahati
- 1996 - Indian Institute of Management Kozhikode (IIM-K)
- 1998 – first IIIT established under PPP model. IIIT (Hyderabad)
- 1998 - Indian Institute of Management Indore
- 1999- IIT (Bangalore) established under PPP model.
- 2001 - IIT Roorkee
- 2005 - Indian Institute of Management Shillong
- 2008 - IIT Ropar
- 2008 - IIT Bhubaneswar
- 2008 - IIT Gandhinagar
- 2008 - IIT Hyderabad
- 2008 - IIT Patna
- 2008 - IIT Jodhpur
- 2009 - IIT Mandi
- 2009 - IIT Indore
- 2010 - IIM Ranchi
- 2010 - IIM Rohtak
- 2010 - IIM Raipur
- 2012 - 11th Year Plan (GOI) establishes 7 new IIMs by the end of 2012. IIM Ranchi, IIM Rohtak, and IIM Raipur are already operational with IIM Tiruchirapalli scheduled to open in 2011 and IIM Jammu and Kashmir, IIM Rajasthan, IIM Utrakhnad scheduled (to be operational in 2012).

Chapter 3

In Partnership with the State: Trade Associations' Role in Fostering Development in the Indian IT Industry

I. Introduction

How should developing states manage development in industries defined by high rates of innovation and change? The neoliberal answer to this question is that states should not attempt to do so. This view is based upon a belief in the self-regulating power of the market (i.e. market fundamentalism) and the need to restrict government involvement, which may interfere with this self-regulation. Instead, neoliberals suggest a “roll back” of the state that reduces state involvement in the market. On the other hand, critics of neoliberalism argue that states should play an active role in promoting development, suggesting that the achievements of developmental bureaucratic states (DBS)³¹ provide evidence of the efficacy states might have in promoting industrial development and raising the living standards of the population more generally.³²

Yet, in practice, neither complete roll back of the state nor adoption of the DBS model appears tenable today. The neoliberal strategy of state roll back is difficult (if not impossible) to achieve. Karl Polanyi's observation that states and markets historically evolved together and markets require the regulation that states provide (K. Polanyi, 2001

³¹ The DBS is best exemplified by the economic success achieved by Japan and South Korea (O'Riain, 2000).

³² Refer to the following for the achievements of developmental states: (Amsden, 1989; Evans, 1995; Gold, 1986; Johnson, 1982; Wade, 1990a)

[1944]) helps to illuminate the contradictions inherent in striving for markets without states. The practices of neoliberal states may paradoxically extend the reach of the state further into the market rather than minimizing its role. The most recent reminder of this fact is found in the 2008 global economic downturn: caused by risky investment practices within the U.S. financial community and a lack of institutional oversight, this crisis required unprecedented government intervention to stabilize the global economy. The alternative statist approach also presents challenges. This intensification of production networks spanning across borders has caused some country-focused development strategies to falter (Amsden, 1989; Johnson, 1982; Wade, 1990b).

Yet, there are a number of institutional practices that states may adopt to offload key government responsibilities to quasi-state actors. These practices move beyond privatization and deregulation of key governmental services to include developmental partnerships between the state and private interests – Public-Private Partnerships (PPPs). However, the relationship between PPPs and neoliberal state practices in the context of developing states is under theorized.³³ Using a historical institutional approach, in this chapter I detail the rise of industry trade associations in first influencing and then later crafting key aspects of state industrial policy in India. This analysis will focus on the broadening role trade associations play in developing the Information Technology (IT) and IT enabled service (ITES) industries in India.

This chapter is organized in four sections. In the following section, I briefly survey the literature on trade associations and their effect on industry development. Then, I offer a historical narrative of the expanding policy role of one Indian industry trade association, the National Association of Software and Service Companies (NASSCOM),

³³ For exception see (Brenner & Theodore, 2002; 2005, pp. 76-78)

as it and the IT and ITES industries have developed. The third section analyzes the developmental role that trade associations may play in state policy. This analysis emerges from an account of the changing role of NASSCOM in India, focusing in particular on its role in advancing educational reform and developing new industry “clusters.”

II. Trade Associations in India’s IT and ITES Industries: Historical Development

Previous work on trade associations tends to focus on their role as platforms for collective action and lobbying. However, there is an increasing recognition of the complementary effect trade associations can have in shaping development through its interaction with the state (Hall & Soskice, 2001; Maxfield & Schneider, 1997). Trade associations are voluntary, not-for-profit organizations composed of policy entrepreneurs within firms located in the same industry that seek to collect, share and disseminate industry relevant information and provide a platform for collective representation and lobbying (Lorenzoni & Lipparini, 1999; Streech & Schmitter, 1985; Tucker, 2008).

Yet, mobilizing collectively to advance common interests may be challenging (Olson, 1965). Three literatures offer influential accounts of the role of trade associations. The literature on new institutional theory tends to view associations as agents of reproduction, rather than of change (DiMaggio & Powell, 1983; Oliver, 1997). Reproduction of conventions and values is carried out through the associational routines of “licensing, training, and professional development and the monitoring and disciplining of behavior” (Greenwood, Suddaby, & Hinings, 2002). The literature on innovation and cluster analysis goes a step further and recognizes trade associations’ abilities to serve as

competitive assets that take “leading roles in the continuing upgrading of industry clusters,” beyond mere lobbying organizations and social organizations.³⁴ The developmental state literature refers to associations as facilitators in state-society relations (Evans, 1995; Pingle, 1999; Saxenian, 2000). This literature tends to characterize associational roles primarily in terms of the forum they provide for policy makers and industry leaders to interact and create state-society linkages (Evans, 1995; Pingle, 1999; Saxenian, 2000), although more recent studies found that patterns of action by business associations can directly affect actions taken by the state (Schneider, 2004; Sinha, 2005).

Building upon these analyses, I argue that in some cases associations may move beyond influence and lobbying activities and become agents of change, in partnership with the state, particularly in select areas that affect their industry. Whereas the innovation and cluster analysis literature does not specify how associations serve as “competitive assets” nor how associations’ may contribute to industrial development, I suggest that trade associations take up roles that include serving as brokers between various stakeholders, leading industrial policy formation, urban development planning, and securing public industry goods, such as educational reform. Finally, building on the developmental state literature, I suggest that trade associations may not just provide a forum for exchange between the state and industry to produce “embeddedness.”³⁵ They may also be understood as developmental actors in their own right, shaping, and at times, leading industry policy formation and implementation. Attention to these facets of trade

³⁴ “Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate” (Porter, 2000, p. 15)

³⁵ Embeddedness refers to “a concrete set of connections that link the state intimately and aggressively to particular social groups with whom the state shares a joint project of transformation” (Evans, 1995, p. 59)

association roles sheds light on the role of the neoliberal state in the economy, particularly in developing economies.

In this section, I illustrate the shifting institutional practices of the state under the influence of neoliberalism by offering a detailed examination of interactions between the Indian state and the NASSCOM, the sectorial industry association for the IT and ITES industries. The IT industry in India is an important location from which to study changes in state involvement in promoting industrial development and upgrading because industry success has occurred in spite of India's developmental state failures (Chibber, 2002, 2004; Herring, 1999),³⁶ which have been illustrated by low growth rates in many strategic industries, such as electronics and technology hardware, in the post-independence period. By studying the contrast between IT industry success and other developmental failures in India we can theorize new models of industrial development where other "stakeholders" provide significant input, particularly in emerging economies, where state capacity for industrial development and supporting institutions are often less robust and developed than those in industrialized countries. This shift embodies a broader shift away from a developmental state model and toward a model of "developmental governance" that more explicitly relies on multiple actors based in civil society, including trade associations.

There are three main national level trade associations in India. These are the Federation of Indian Chambers of Commerce and Industry (FICCI), the Associated Chambers of Commerce and Industry (ASSOCHAM), and the CII. These national associations have large direct memberships of companies. Under this broad

³⁶ Bureaucratic rationality without strategic rationality may lead to state incoherence and developmental failure and the case of India in the post-independence period is the exemplar of this argument (Chibber, 2002).

representational umbrella are a number of regional chamber of commerce³⁷ and industry specific trade associations (or “sectorial associations”) that represent the narrower interests within a specific industry. These associations are typically members in the national level trade associations and information concerning the agenda of these different association agendas may be shared. However, national level associations are less effective than sectorial associations at shaping *industry specific* policy because their diverse membership across various industries means that members have competing interests, which make it unlikely that membership consensus will emerge around specific policies (Pingle, 1999).³⁸ Sectorial trade associations representing a single industry with narrower interests may be more effective in proposing and pursuing industrial policy and industry specific solutions and programs.

NASSCOM is identified as the most important association representing the software and services industries according to industry managers (personal interview, VP, Infosys, Dec. 3, 2008)³⁹ and governmental officials.⁴⁰ NASSCOM was founded in 1988 with 38 members (NASSCOM, 2009b), but today the organization has over 1300 members comprised of both Indian and multinational companies that have a presence in India (NASSCOM, 2009a). Together, these members account for over 95 percent of the revenues of the software and service industry in India and employ over 2.24 million professionals (NASSCOM, 2009a). The high membership revenue percentage of the total

³⁷ There are state and citywide associational bodies in India, such as the Bengal Chamber of Commerce and the Indian Chamber of Commerce in Bombay. This paper, however, focuses on those associations identified by government and industry leaders as playing the most central role in industry development.

³⁸ For a more sanguine view of the constructive role large national business associations may play on the political process see (Sinha, 2005).

³⁹ Personal interview, Vice President, Infosys, December 3, 2008; Personal interview, Executive, Infosys, December 10, 2008; Personal interview, Executive, Evalueserve, May 22, 2009.

⁴⁰ Personal interview, former IT Secretary, October 14, 2008; Personal interview, Director, Software Technology Parks of India, November 7 2008.

revenue generated in this sector in India provides the organization the legitimacy to speak as “the voice” of the industry with a high degree of credibility. The organizational structure of NASSCOM contains both positions filled by rotating company executives and full time staff. The elected company executives typically hail from the largest and most reputable firms in the industry, which skews the organizations’ goals toward the interests of larger firms and away from the smaller firms that constitute the majority of the company membership base.

The high growth rates associated with India’s IT and ITES industries have prompted other developing economies (e.g., China, Brazil, Philippines, Poland, Russia and South Africa) to try to replicate India’s service export model (Business India Intelligence, 2006). In addition, India’s IT industry trade association, NASSCOM, serves as a model for other governments, entrepreneurs, and trade associations that seek to grow their developing country’s burgeoning IT industries. Some foreign countries, mainly in Asia, Latin America, and Africa, want to replicate what NASSCOM has done in their countries,⁴¹ with some attempting to imitate the NASSCOM industry association model with organizations such as BRASSCOM in Brazil, GASSCOM in Ghana, and SLASSCOM in Sri Lanka (Rai, 2010).

The partnership between the state and trade associations is one important source in helping to facilitate this industry move toward increasing higher value activities. NASSCOM adopted four roles in its interaction with the state to help the IT industry develop and upgrade in India.⁴² First, NASSCOM was instrumental in helping the

⁴¹ Personal interview, Indian senior administrative servant, Government of India, February 27, 2009.

⁴² I do not argue that the relationships between the state and trade associations in India are the only factor in industrial development. Instead, I argue that it is an important, yet relatively ignored and under theorized factor in explaining industrial development in the IT and ITES sectors in India.

software industry gain recognition as a “strategic” industry from government officials and the general public. Broadening the government’s perception of what is considered a strategic industry to include software and services, instead of just electronics and hardware manufacturing industries, was critical in order to build the emerging software cluster, remove industry specific constraints, and provide the basis on which future industrial upgrading could occur. Second, NASSCOM and CII helped remove industry constraints through lobbying and re-regulation. This was achieved in part through lobbying state officials for telecom deregulation, modification of paternalistic labor laws to permit women to work nights, and helping to coordinate government departments at various levels to streamline interaction with industry. Third, NASSCOM provided public relations and impression management services for the industry. This was instrumental in helping to change the perception of India beyond just a low cost labor destination, to one that has higher order capabilities. Fourth, NASSCOM provided the state leadership for further industry development as the industry matured and primary constraints on growth were removed. While each of these four roles arose during different periods to help solve industry specific problems, the adoption of a new role did not mean discarding the previous role. Rather, the association itself consistently increased its capabilities over time, juggling new responsibilities alongside existing ones.

In establishing a more prominent role in industry development, NASSCOM’s strategies have shifted in response to evolving industry challenges and the increasing capabilities of the associations. I argue that the cumulative result of these strategies has led to more influence on the state to shape the overall direction of developmental policy in the IT industry. In the most recent stage, NASSCOM has moved beyond policy

influence through lobbying to actually write policy on behalf of the state.⁴³ In the subsections below, I expand upon the nature of each of the four roles introduced above. Following this historically situated account, in section four I elaborate upon NASSCOM's expanded policy role.

III. Recognition of Software as a Strategic Industry

NASSCOM's primary focus from its inception, in December 1988 until the industry surpassed the \$1 billion revenue mark in 1997, was to gain recognition as a strategic industry worthy of attention and support by the government. Without this recognition, the Association had little opportunity to achieve other collective goods on behalf of the industry. The organizational goal of recognition was closely associated with NASSCOM President Dewang Mehta's leadership of the Association from 1991 until his death in 2001. During this period NASSCOM aggressively promoted the industry in order to capture the attention of policy makers and the government and led the Indian government to begin to see software as a strategic industry.⁴⁴

Mehta raised the visibility of the industry domestically and internationally. Under his leadership NASSCOM became strong, financially successful, and "a recognized opinion-maker and leader in the IT Industry," turning the organization into "a major powerhouse, initially in Delhi, then all over India, and by the end of the nineties, all over the world"(Natarajan, 2001). Raising the visibility of the nascent industry was important because the Indian developmental state long held a bias toward manufacturing industries

⁴³ Saxenian's notes NASSCOM's role in shaping industry policy through lobbying, yet her work neglects the Association's leadership on far reaching programs that position the Association as an agent in industrial development through its partnership with the Indian state (Saxenian, 2000).

⁴⁴ Personal interview, former President, NASSCOM, July 7, 2006.

in conceiving and defining strategic industries and for crafting developmental policy (Chibber, 2004). The software and service industry was not an obvious choice for developmental efforts until the outreach and lobbying efforts by NASSCOM started to change governmental attitudes.⁴⁵ The organizational success at recognition in these early years was embodied in the recognition Mehta received:

It would not be an indulgence in hyperbole to say Dewang Mehta transformed an entire industry. His confidence about the ongoing successes of the software exports industry bordered on arrogance, . . . He straddled NASSCOM like a veritable colossus and made it an association that was the cynosure of all business and political eyes, an entity to be admired, sometimes hated and feared, but never ignored! (Natarajan, 2001)

The fact that NASSCOM could no longer be ignored, particularly amongst politicians, points to one of the organization's key successes. Once NASSCOM had captured the attention of policy makers and the Indian public, it was in a position to more effectively push for other industry gains. This period, called the "evangelizing phase" by NASSCOM leadership,⁴⁶ was instrumental in creating a forum and voice for the industry and allowed the organization to begin to create enduring relationships with governmental ministries that could help the industry remove constraints on growth.

During the mid-to-late 1990s the organization gained widespread access to policy makers. According to one industry leader, "the doors of every bureaucrat and politician were always open to his [Mehta's] ideas and suggestions" (Natarajan, 2001).

NASSCOM's political leadership was reflected in the appointment of Mehta's in 1988 as a member and spokesperson of the IT Task Force established by the Prime Minister to draft a national informatics policy ("Nasscom chief Dewang Mehta found dead in Sydney," 2001). During this period the Association gained formal representation on

⁴⁵ Personal interview, former President, NASSCOM, July 7, 2006.

⁴⁶ Personal interview, former President, NASSCOM, July 7, 2006.

various government committees, such as the Ministries of Information Technology, Commerce, Finance, Human Resources Development, Labor, External Affairs, and the Department of Telecommunication (NASSCOM, 2006a).

NASSCOM moved from a relatively small and obscure sectorial association of a little known industry to a highly visible association representing a quickly growing industry in less than ten years. The Association's rise provided informal relational ties with individual politicians and formal organizational ties to government ministries that provided it the conduits through which it could influence policy makers on legislation and policies that affected the industry.

IV. Lobbying and Deregulation

NASSCOM's role historically and currently is focused on influencing governmental policy and improving the interaction between various governmental bodies and the industry. NASSCOM began formal lobbying in 1991 around tax waivers and incentives and then focused on deregulation efforts that helped to remove a number of obstacles to industry growth and development. During this time, the trade association continued to argue in favor of free trade, zero tariff protection, deregulation of the telecom market, and the creation of software technology parks (STP), which have helped to improve the growth and profits of the industry. In addition, the Association also urged the state to adopt and extend a number of financial incentives, such as state tax exemption on profits from software exports, discounted rates on utilities, and the infrastructural improvements in the special economic zones (SEZs) dedicated for the industry located in IT hub cities (NASSCOM, 2006a; Pingle, 1999).

A key early lobbying victory that helped the nascent Indian IT industry grow was a one-year waiver on income tax for software exports in the 1991 government-planning budget. NASSCOM President Dewang Mehta received an endorsement from 40 Members of Parliament for the income tax waiver on software exports, which in turn led Dr. Manmohan Singh to provide a one-year waiver in the 1991 budget (Kanavi, 2001). The effect of the income tax break is widely credited with helping the industry grow.

One of the most significant efforts NASSCOM lobbied for, according to industry insiders, analysts, and NASSCOM leadership itself, was telecom deregulation.⁴⁷ Before deregulation, it was extremely difficult to procure telephone lines and performance and reliability of utilities were also so bad that operating at a competitive global level was nearly impossible. According to management of leading Indian IT company Infosys,⁴⁸ it took “a year to just get a telephone line” (Teather, 2007) and in 1982 “we lost a huge project because of that” (2007). As a result, telecom was identified as one of the main problems limiting the growth for the industry.⁴⁹ NASSCOM launched an intense marketing campaign aimed at influencing policy makers and citizens to think of the industrial constraints limiting the growth of the new Indian economy. The marketing slogan used during the 1990s by the association was a play on a popular Hindi slogan, “Roti, kapda, makaan,” which roughly translates to “food, clothing, shelter.” The slogan referred to the three necessities citizens needed from the state. NASSCOM added two more necessities to that slogan, “Roti, kapada, makaan, bijlee, aur bandwidth,” which

⁴⁷ Although deregulation is better conceived of as reregulation as noted above, I will continue to use deregulation to remain consistent with data sources. Telecommunications deregulation began in India in 1991 with the removal of most industrial licensing agreements. This process proceeded slowly and unevenly over a ten-year period.

⁴⁸ Infosys is one of top ranked IT companies in India. (Dataquest, 2009)

⁴⁹ Personal interview, former President, NASSCOM, July 7, 2006.

translates to “food, clothing, shelter, electricity, and bandwidth.”⁵⁰ With the addition to the new phrase, electricity and bandwidth were given the same importance as food, clothing, and shelter. The slogan was directed at two audiences. One was “intended to catch the attention of the common man that these are essential necessities,”⁵¹ while the other was the state that at the time controlled both of these resources, but had difficulty providing them consistently and efficiently.

Another aspect of NASSCOM’s early lobbying agenda included efforts to loosen regulations governing foreign ownership and operations in industry in India. India had a number of restrictions that made foreign ownership difficult. This was due in part to the official socialist orientation of the state and government’s wariness toward (foreign) capital and its efforts to restrict multinationals within the country during the 1970s. NASSCOM tried to attract multinational companies (MNCs) back to India during the early 1990s to build the credibility of the country as an IT destination and sourcing location. Attracting MNCs had the important effect of improving industry capabilities in India through training employees and technology transfer. According to a former President of NASSCOM, the strategy during this time was to bring subsidiaries of large MNCs first, then promote independent Indian company delivery second.⁵² The first three multinational companies to come to India were GE (1994), American Express (1996), and British Airways (named WNS). NASSCOM lobbied the government to make concessions on laws related to foreign ownership to get all three to come to India. NASSCOM effectively lobbied on behalf of the IT industry securing tax incentives,

⁵⁰ See ("A bachelor who romanced with IT," 2001). Personal interview, former NASSCOM President, July 7, 2006.

⁵¹ Personal interview, Vice President, NASSCOM, January 14, 2009.

⁵² Personal interview, former President, NASSCOM, July 7, 2006.

deregulation of the telecommunications sector, and entry of foreign MNCs that provided a source of technology and skill transfer to industry.

V. Public Relations and Impression Management

The IT industry began to receive widespread recognition domestically and globally during the mid-to-late 1990s and the early 2000s, which prompted NASSCOM to increasingly manage public impressions both inside and outside India. The move toward more aggressive impression management during this period was a response to two main factors. First, in 1997 the IT industry in India surpassed one billion (USD) in revenues, which garnered public attention in India and abroad (Kanavi, 2001). The increasing attention from both inside and outside India required organized and sustained programs to address industry challenges ranging from concern over industry capabilities to the security of data processed in India.

The second factor was the changing nature of the global organization of service work. During the late 1990s there was an intensification of the shift away from the “bodyshopping” model to a global delivery model. “Bodyshopping” refers to the movement of specialized labor, such as software engineers, from their home country, typically a low cost labor market, to another country that usually has high cost labor. During the dot-com boom of the late 1990s American IT companies pushed strongly for increases in the number of H1B visas, which permitted temporary entry of skilled professionals, such as computer programmers (Chellaraj, Maskus, & Mattoo, 2006). The bodyshopping of these IT engineers, often from India, was increasingly used as a solution to address the U.S. shortage of engineering talent. The common practice was a harbinger to the acceleration of offshore outsourcing of IT services as it provided familiarity with

foreign Indian programmers and provided a transfer of technology and “know-how” when these programmers returned to their country of origin. Western firms’ experience working with Indian programmers, the economic imperative to cut labor costs in the face of a global technology slump, and large investments made in global telecommunication infrastructure during the dot-com boom led to an acceleration in offshore outsourcing to service delivery locations like India. This changing global organization of work in services brought increased attention from foreign governments and publics that were interested in or worried about the capabilities and the cost advantage of the Indian software and service industry. The rapid global industry adaptation from using “Indian labor” in the late 1990s to using “labor in India” in the early 2000s brought a host of new challenges that required impression management for “destination India.”

Two main concerns voiced among western firms and the general public were the capabilities of Indian labor and firms and the security of sensitive data processed by Indian labor for western firms. NASSCOM addressed these issues in a number of ways. These strategies included specific marketing campaigns, panels at their annual membership meeting, direct meetings and outreach to western firms and governments, and showcasing exemplary member companies to visitors from western firms and governments.

In the mid-1990s NASSCOM sought to shift the perception of India as simply a low cost labor destination in software and services to a quality labor destination that can deliver high value (and higher profit margin) services. NASSCOM’s efforts to shift this perception began as an impression management through marketing campaigns, trade conferences, foreign public relations, but later shifted into increasingly proactive

programs in partnership with the government to build educational capacity, labor quality, and the upgrading of worker skills. These more extensive efforts at upgrading worker skills and higher education will be discussed in detail below.

Data security also became a significant concern as back office services providers in India processed increasing amounts of personal and firm level data in variety of sensitive areas including finance, human resources, and medical claims. NASSCOM responded with a number of events to raise awareness about the problems, while also signaling to the industry that this issue was being addressed (NASSCOM, 2006d). The Association also helped establish the India Cyber Lab, in conjunction with the Mumbai police, which was a unique PPP project that formed out of the first-ever Cyber Safety Week in 2003. Later NASSCOM crafted a “Security Initiatives” programs to address these concerns and push member companies to adopt more stringent security practices. These included creating awareness, setting guidelines, defining standards, creating special training on Information Security, and introducing certifications(NASSCOM, 2006d).

VI. Trade Associations in India’s IT and ITES industries: Role as Developmental Actors

In this section I detail the changing strategies NASSCOM has undertaken in order to deal with obstacles arising as the industry rapidly expands. I argue that NASSCOM’s role and focus has become significantly broader, making it a key actor in industrial development in partnership with government.

The problems of recruitment, employee attrition, and rising labor costs became major obstacles for the industry as it grew exponentially (See Table 3.1 for employment growth), while trying to keep costs low for foreign customers. NASSCOM pursued two different strategies with the government in trying to expand the labor market and improve labor quality. One strategy that NASSCOM pursued focused on upgrading industry related education in the country. It has pursued this by stepping into the traditional governmental space of educational policy formation. Another strategy NASSCOM adopted was to help develop and promote emerging IT clusters in India. The organization achieved this by consulting with various state governments in India that were trying to replicate the success experienced in the largest IT hubs in India. These strategies demonstrate the ways in which the trade association moved into traditional governmental areas of activity. Yet, it is important to recognize that NASSCOM was invited by central and state governments to partner with them to draft and help implement these industrial policies in areas that were traditionally the sole domain of the state. These practices demonstrate the broadening scope of PPPs, their increasing use as a developmental strategy in developing countries, and the further blurring of the already porous boundaries between the state and civil society.