From telecom switches to telecenters: Changes in the 'telecom for development' discourse in India (1947-1999)

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***Abstract*— The telecom sector has been an important actor in the Indian state's policies for 'development.'[1] However, the nature of the linkage between telecom and development, as well as the role of the state in this process, have changed over time. How did Indian telecom policy, with its focus on telecom *production* for development and its dismissal of access to telecom as a luxury up until the 1980s, become an advocate for telecom *access* for development by the late 1990s? Using policy documents and an analysis of secondary literature, I trace the state's motivation to restructure telecom policy between India's independence and 1999, by which time the core objective of the telecom policy had become the "availability of affordable and effective communications for citizens." I argue that motivation alone is not enough to bring about policy change. Since the state had to negotiate with diverse interest groups both within and outside the state, and also maintain its own legitimacy, the state's motivation had to be backed with state capacity and political opportunity before it could restructure telecom policy. Pushing further at this framework of policy change, I suggest that motivation, capacity, and political opportunity are determined not just by material conditions but as crucially by ideological constructs and discourses.**

***Index Terms*—India, telecom policy, telecom production, telecom access**

I. Introduction

In 2006, the Government of India approved a scheme to establish 100,000 Common Services Centers (CSCs) equipped with a computer and basic support equipment in 600,000 villages of India between 2006 and 2010 [1]. The CSCs are described as "service delivery points," but also as "change agents" and enablers of developmental goals [2]. The CSCs reflect a tremendous shift in priorities for a state that had labeled telecom access, including basic telephony, a "luxury" just two decades earlier.[2] Up until the 1980s, the Indian state focused on telecom production as an agent for economic development, while dismissing access to telecom as a luxury. By the end of the 1990s, however, the telecom policy read as follows

> access to telecommunications is of utmost importance for achievement of the country's social and economic goals. [5].

What motivated these shifts in the Indian state's position: how did a state that focused on telecom production for development and dismissed access to telecom as a luxury become an advocate for telecom access for development? How were policies that reflected this shift pushed through? I examine these questions in the crucial period between 1947—the year that India gained independence from British rule—and 1999—the year that an important milestone of Indian telecom policy, the New Telecom Policy 1999 (NTP 99), was announced. While there have been several changes in the national telecom policy in the years following NTP 1999, the Indian state's focus on telecom access as a development priority has never declined post 1999.[3]

The theoretical contributions of this paper are twofold. First, I adapt Yashar's motivation-capacity-opportunity framework to a study of policy change using the case of the telecom sector in India [6]. Excellent studies exist of telecom policy restructuring in India [3],[4],[8],[9]. I build on top of these to argue that a motivated state is not enough to push policy changes through. Motivation has to come together with state capacity and political opportunity to make policy changes happen. Second, I take seriously both domestic and global discourses on 'telecom and development.' I contend that they are interlinked and act as powerful motivating and legitimizing factors in the process of policy change.

The paper will also be useful specifically to the community of Information and Communication Technologies and Development (ICTD) researchers and practitioners. The deployment and use of ICTs in any region is closely linked to the telecom policy environment in the region. In addition, ICTD practitioners are involved directly in policy analysis as well as policy making. The framework I suggest will be useful to understand why the telecom priorities of the Indian state evolved the way they did, where the state would be willing and able to take it next, and what plans of action may be adopted by different interest groups in order to bring about

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[1]There exist many definitions of the word 'development' and an even larger number of critiques of each definition. For the purposes of this paper, I am concerned with 'development' as defined and used by the Indian state at different points in time, and broadly referring to improved economic and social conditions of living.. Following this explanation, I will use the word without quotes.

[2]Ref [3] and [4] describe a telling incident:".. when a Member of Parliament complained about poor telephone service in Delhi during the early 1980s, the then telecommunications minister went on to remind him that in a poor country like India, the telephone was a luxury."

[3]The public access model in particular has remained relatively unchanged. In fact,the 'Public Teleinfo Centre' mentioned in NTP 99 is remarkably similar to the CSCs of 2006.

policy change.

Finally, the paper offers a way to challenge the idea that access to telecom is somehow naturally linked to development —an idea that is implicit in the words of development agencies and states today. As I show in this paper, alternative visions of the linkage between the two have existed. Tracing the battles that have been fought over stabilizing the 'telecom access and development' linkage help understand that this was no inevitable trajectory.

In the next section, I lay out the theoretical framework and main arguments made in the paper. Next, I describe the Indian telecom policy prior to the 1980s. The following two sections examine the changes in policy in the 1980s and 1990s, laying out the motivation, capacity, and political opportunities in the context of which the state had to make policy changes in these periods. Finally, I present in detail the conclusions I have previously outlined.

II. Theoretical Framework: Motivation, Capacity and Opportunity

It is now widely recognized that policy change is seldom motivated solely by technological change even in sectors related to technology. Instead, a variety of political, economic, and cultural factors equally motivate such change. I take this as my point of departure and contend that motivation translates to outcome only in combination with state capacity and political opportunity. Further, I suggest that motivation, capacity and opportunity are shaped not just by material circumstances but equally by ideological constructs and prevalent development discourses, in this case the 'telecom and development' discourse.

Yashar, in her study of indigenous people's movements in Latin America, argues that new needs and motives do not automatically cause the emergence of social movements [6]. Social movements "must build (upon) organizational capacity to initiate and sustain a movement." Nor does having a motive and capacity automatically give rise to a movement in the absence of political opportunity. While Yashar's analysis is in the context of social movements, I find that her three explanatory factors are equally valuable in an analysis of policy making, particularly in the context of states dealing with a large number of interest groups such as India. Policy-making, much like a social movement, not only requires the policy-maker (here, the state) to be motivated, but also requires that it negotiate with heterogeneous interest groups both within and outside that often have conflicting interests. In this situation, the 'capacity' of the state is a measure of the support or resistance extended by different interest groups towards its decision to change a particular policy. Political 'opportunity' indicates the opening up of prospects for the state to manage conflicts between these groups while inflicting the least harm on its own political legitimacy and interests. I adopt this framework for analysis, arguing that motivation without capacity or opportunity does not lead to policy change.[4]

I use Yashar's motive-capacity-opportunity lens to examine why India moved from a policy that focused on telecom production for development to one that perceived telecom access (especially through telecenters) as a means to bring about development. I make two arguments using this framework and in the context of India's telecom policy. The first is that the the Indian state's 'motivation' for policy change in the telecom sector came out of changes in technology and from its need for legitimacy among the Indian electorate and international institutions. Its 'capacity' (or lack thereof) depended on the extent of support or resistance that it faced from heterogeneous interest groups (including different groups within the state itself) that would be affected by the policy change. The state's capacity was also dependent on the relative importance of these interest groups to the state at the time policy change was being debated. Finally, the state's 'opportunity' determined how the state could leverage its capacity or overcome its incapacity with interest groups in specific situations. In the case of telecom reform, opportunities arose from the global and local ideological climate, including the development discourse, in which the state operated. The state was often able to use prevalent discourses to justify policy changes even in those cases where it did not have the support of dominant interest groups.

Thus, I extend Yashar's framework in the context of policy making to make my second argument. I contend that motivation, capacity, and opportunity are not shaped solely by material circumstances. Cultural legacies and discourses of telecom and development play an equally crucial part in pushing policy change through. Here I draw on Chakravartty's argument that cultural legacies and competing visions of the role of technology in development have been critical in determining the adoption of policy change in the case of India [4]. However, where Chakravartty's focus is on the visions of modernity, technology, and development offered by Indian statesmen, I suggest that discourses outside India too have been pivotal in creating opportunities for policy change.

III. The Indian Telecom Story

In this section, I examine three 'eras' of telecom policies in India, devoting a sub section to each. The first and longest era of telecom policy was between 1947 and the early 1980s. Industrial policy in India in this period was based on the state-led, Import Substituted Industrialisation (ISI) model and the telecom industry was no exception. Telecom production was perceived to promote technological self-reliance and generate employment, and this in turn was expected to contribute to economic growth and development. Telecom restructuring was initiated in the 1980s, which I term the second telecom era. In this period, the focus expanded from telecom production to include both production and telecom access as linked to development. In both the first and second telecom eras,

[4]It is important to note here that the paper focuses on making policy changes, and does not delve into policy implementation, which is a related but completely other story.

telecom mainly referred to telephony. The third era in telecom policy was the 1990s when the telecom sector was liberalized more intensively. This period focused almost exclusively on expanding telecom access, rather than on production, and also linked telecom access, rather than its production, to development. The 1990s was also the period when technologies besides the telephone (mainly semiconductor-based 'information and communication technologies' including computers) became widely available and gained prominence in policy.

A. 1947-1980: Telecom production for development

In the decades following independence, the technology discourse in the Indian state drew on the national priorities at the time: self-reliance and collective interest before individual profit [4]. India pursued an ISI model of state-led development with a view to promote local industries and gradually replace the manufactured products that were produced abroad and consumed as imports by the country. To achieve the goal of self-reliance and simultaneously ensure a balance between economic development and social equity, most industries were state-owned. Much like in other countries following the ISI model, as well as in other industrial sectors within India, the Indian telecom sector was state-owned in this period.

The Indian telecom sector post independence was built on top of an extensive telecom network and telecom bureaucracy that had been established during British rule. Growth plans for telecom were dictated by the allocation of the national planning body, the Planning Commission [7]. Telecom competed with water, health, energy, and literacy for allocation of resources from the Commission. Since telecom did not constitute a 'core' sector or a development priority for the Indian state and was, in fact, identified as a 'luxury' meant for the elite, it was only allocated a small percentage of the Planning Commission's outlay [4],[7],[8]. Thus, state investment in the telecom sector was low in this period.

The state was the regulator, policy maker, service provider, and equipment manufacturer for the sector. The Post & Telegraph (P&T) wing of the Ministry of Communications was the sole communications provider in India in this period. P&T also produced most of its own equipment, importing and redesigning it to adapt it to local condition[8],[9].[5] Government enterprises such as Indian Telephone Industries (ITI, est. 1948) and a handful of other domestic producers manufactured the redesigned telecom equipment, including switches, consumer premise equipment (CPE), and transmission media.

While telecom was not explicitly a development priority, the Indian state nevertheless had its own version of using the telecom sector for development. However, rather than telecom access, the Indian state focused on telecom *production* as a means to economic development [4]. Telecom production was development-oriented in two ways: one, the state set up telecom equipment manufacturing plants in economically underdeveloped regions of the country in order to encourage regional development; and two, the Department of P&T provided employment opportunities and employed over half a million people in the telecom bureaucracy by 1980.[6]

The state-led, production-focused model of the telecom sector described above had several consequences for the working of telecom in India. First, the model often resulted in the installation of expensive, outdated, and locally inappropriate equipment, which affected the cost and quality of telecom services. The P&T bought "virtually obsolete" equipment for installation [4]. By the time the equipment was redesigned, produced, and installed, it was typically outdated.[7] In addition, the equipment produced in industrialized countries was fundamentally ill-suited to Indian conditions, especially the climate.[8] The quality of equipment further led to the provision of poor service to telecommunications customers [9].

Second, the model encouraged the emergence of a close-knit relationship ("political telematique") between the government-run telecommunication monopoly and its equipment suppliers[8:148].There was thus a strong preference within the telecom bureaucracy to import equipment or to have its regular suppliers manufacture it.

Third, while the telecom bureaucracy had expanded manifold in the years since independence, it continued to provide low-quality service.[9] Even though India employed one of the highest numbers of employees per telephone line, the installation and maintenance of equipment was poor.[10] This was largely because employees were poorly trained. They also earned among the lowest wages in the public sector and petty corruption was rampant. Customers faced a lot of trouble getting a telephone connection. There were long waiting lists for obtaining one (700,000 in 1981) and a waiting period of between two and ten years from the time of registration to the installation of a phone [4],[9]. Nor did customers' troubles end with the installation of a phone: high tariffs and incorrect billing continued to plague them.

Finally, since telecom services were identified as a luxury, state investment in the sector continued to be low. This led to one of the lowest teledensity figures in the world (less than 0.5%). In addition, there was high urban bias, with 90% of phones catering to 10% of the population. Less than 1% of all

[5]Most of the design was carried out at the Telecommunication Research Center (TRC) in Delhi [9]. People in the telecom sector have argued that the TRC was perhaps not qualified for this job.

[6]This included a large number of members of marginalized castes, religious minorities and tribal groups especially in the lower rungs of the telecom bureaucracy [4].

[7]See [8] and [9] on the disastrous implications of installing the Belgian pentaconta crossbar switches in the 1960s. .

[8]Electromagnetic switches, for example, were probably not optimal, given the large number of calls handled by a switch and the hot and humid Indian climate, both of which resulted in high wear and tear of these switches [10].

[9]The department's workforce, especially the lower rungs of the bureaucracy, grew rapidly through the 1950s to the 1970s. By the 1980s, the department had a bottom-heavy and highly unionized structure, with more than half a million employees working as telephone operators, mechanics, office peons and casual labor [4:234]. These jobs were also some of the lowest paid in the entire Indian public sector.

[10]India had a figure of 7.4 telephone lines per employee as opposed to Turkey's 17.91, Australia's 54.43, US's 98.55, Japan's 115.95, and Sweden's 120.50 in 1980 [9:202].

the villages in the country had access to telephones [7]. In addition, the revenues from telecommunications were not invested back in the sector and went towards subsidizing the postal system [8], [9].

B. 1980-1990: From telecom production to telecom production and access for development

The decade of the 1980s saw a transition in focus from using telecom production for development to the use of both telecom production and telecom access as development tools. The state's motivation for change came out of its quest for political legitimacy among the electorate. It was also responding to the international focus on the linkages between telecom access and development. The state's capacity to actually make policy changes was constrained by different interest groups, including the bureaucracy and the private sector. However, the state did bring about some changes because of the political opportunities that it was able to tap.

1) Motivation

The motivation for change at this time came primarily from the state's need for political legitimacy in the face of growing anti-statism [4]. Chakravartty argues that

> India witnessed a growing anti-statism in the public's response to the Prime Minister Indira Gandhi's repressive national state of Emergency in 1977, which culminated in the gross violation of human rights. Social movements of various kinds emerged in this period demanding accountability from the arrogance of the bureaucratic and political leaders who claimed to represent the public's interest. In response to the popular outrage, sections of the political and business elite were able to successfully co-opt liberal and left criticisms of the shortcomings of state-led development to promote the idea of efficient and, more importantly, accountable, market governance [4:236].

The historically neglected telecom sector too came under attack from the rising middle classes with the help of the press. The publication of the Maitland report that identified telecom as the 'missing link' in developing countries brought the international 'telecom for development' agenda to India [11]. The Indian press used this discourse in its discussions of India's telecom sector and the implications for development. It attacked the telecom bureaucracy as bottom-heavy, inefficient and corrupt. It criticized the shockingly low rates of telephone density. The press also proposed the potential direction of change, with prominent national English-language dailies running editorials about telecom reform [4].

The Indira Gandhi administration tried to woo back the middle class in several ways: it deregulated the advertising industry, expanded the communications sector including the television network, and lifted import restrictions on consumer electronics and other 'luxury' goods. Partly in response to the critique against the telecom sector in the press, the administration reorganized the administrative and bureaucratic structures of the telecom department; invited private sector participation in equipment manufacture and service provision; and improved tele-density [4]. As the telecom sector gained prominence, telecom outlay increased from 2.5% to 3.7% of the total allocations of the Planning Commission [7]. Telecom was made a core sector and later named a development priority in 1984. In an attempt to change the administrative structure and working of the state telecom bureaucracy, the Ministry of Communication was restructured and the Department of Telecom (DoT) was separated from the Department of Posts in 1984. [11]

In its attempts to develop a framework for telecom restructuring, the state decided to back the efforts of Satyen (Sam) Pitroda, a US-based Non-Resident Indian (NRI) who had an impressive record in the telecommunication sector. Pitroda appeared before a high level commission on telecom restructuring and suggested that India invest in telecom R&D to locally develop high-quality telecom equipment suited to Indian conditions. He also emphasized that there was high correlation between teledensity and wealth across the world, and that India should make telecom more accessible, especially in rural regions [10]. Pitroda found a close ally in Rajiv Gandhi, who became the Indian Prime Minister in 1984.

Rajiv Gandhi commissioned the Center for the Development of Telematics (C-DoT) in 1984, with Pitroda as its Executive Director. C-DoT's biggest achievement was the development of the Rural Automatic Exchange (RAX) -- a relatively inexpensive rural exchange of low capacity that was suited to Indian weather conditions. While the C-DoT model emphasized technological self-reliance much like ISI, it had a commercial orientation right from the start [8]. Thus, it licensed its technologies to domestic private manufacturers and to the DoT enterprise, ITI. This was unlike the earlier period when switching equipment was either imported or manufactured solely by ITI and a handful of other manufacturers. [12]

C-DoT spokespeople, including Pitroda, regularly went to the press with news of their technological progress and positioned themselves against the "unpopular post-colonial legacy of bureaucratic secrecy"[4]. [13] C-DoT's emphasis on openness and its performance on the technological front also helped Pitroda and C-DoT win the support of user and

[11]In addition, there was a move by the Rajiv Gandhi administration to corporatize DoT and "shake the department out of its inefficiency"[8].The initial plan to break up DoT into six corporations was resisted strongly by the DoT employees. Finally, a more limited experiment was implemented and two corporations -- MTNL (serving Delhi and Bombay) and VSNL (long distance) -- were created in 1986.

[12]Besides changes in the switching equipment manufacture because of C-DoT, the 1980s also saw the more complete liberalization of CPE and transmission media manufacture

[13]By licensing its designs to private manufacturers, C-DoT harmed the interests of the import lobby within the DoT and the domestic equipment manufacturers that DoT had worked with prior to C-DoT. Pitroda openly claimed that "Part of our mission was to inspire a whole new generation of young talent and thumb our noses at the nay-sayers, the political reactionaries, and the vested interests whose prosperity rested entirely on imports." [10]

scientific communities. However, Pitroda's attitude and the negative effect of C-DoT's policies on entrenched interests also brought Pitroda and C-DoT several enemies. As a result, the DoT bureaucracy and the domestic equipment manufacturers opposed C-DoT, delaying its working as much as they could.[14] C-DoT was able to continue work in spite of these hurdles as long as it enjoyed state support and delivered results on time.

C-DoT's troubles started when Rajiv Gandhi lost the national elections in 1989 on charges of corruption. DoT lost no time in convincing the new government to roll back the C-DoT effort [8]. Accordingly, groups within the state started a campaign against C-DoT.[15] The scientists and intellectual community, however, came out in support of Pitroda and C-DoT's R&D attempts [8].[16] In the face of this support, the state's plan misfired, but many C-DoT engineers left because of the controversy (Ibid). It also became increasingly difficult for C-DoT to maintain its earlier track record without state support. Shortly after, Pitroda resigned following allegations of corruption.[17] C-DoT never regained the position it had established for itself in the 1980s.

Pitroda met with much less opposition, however, when he worked on expanding telecom access. In 1986, Pitroda became the chief adviser to the Prime Minister on a public policy program called 'Six Technology Mission'. One of the aims of the program was to expand and improve telecom services [8].[18] The more prominent achievement of the Technology Missions was the expansion of public phone access, especially in rural areas. Moving away from the focus on tele-density, Pitroda suggested focusing on telephone access [10] and ensuring that citizens had access to a phone within a 3-4 km radius of their home. This, he suggested, could be achieved by equipping entrepreneurs with phones that they would operate as public phones, charging customers for phone calls. Chakravartty argues that this

> seemingly modest accomplishment by the technology standards of the day truly transformed the communications landscape in urban and increasingly rural India. [4:242][19]

Restructuring the nature and extent of telecom access using Public Call Offices(PCOs) proved much simpler than the restructuring of telecom production [8]. Since this move did not upset entrenched interests, the PCO mission was fairly successful. The state did not face resistance to this move and thus was able to carry it through fairly successfully.

Thus, in the 1980s, the state changed its sole focus on telecom production as a means to economic development, and its stance that telecom services constituted a luxury. As opposed to the 1970s, the state emphasized both telecom production and telecom access as agents of development through the 1980s. By the end of the 1980s, however, C-DoT declined which had significant repercussions for telecom production in India.

2) Capacity

The above story illustrates that the presence of a motivation to restructure—the need for political legitimacy at a time when the popular sentiment was anti-administration and one of frustration with the telecom bureaucracy—did not necessarily translate to a policy change. The capacity of the state to restructure policy depended on the extent of support or resistance that the proposed policy change faced from different interest groups. In this case, the process of restructuring telecom production was strongly opposed by the DoT bureaucracy and domestic businesses that received regular manufacturing contracts from DoT. With the coming of C-DoT, switch manufacturing was liberalized. This resulted in competition for the older telecom equipment manufacturing businesses. Thus, liberalization gave rise to opposition both from the DoT bureaucracy and from domestic businesses with ties to DoT.[20] The process of restructuring telecom production was fraught with conflicts and delays. These conflicts also resulted in large gaps between the extent of restructuring envisioned and the changes that actually came through.

On the other hand, user groups, especially the urban middle-class, came out in support of the state's decision to restructure telecom policy, especially the focus on access. The C-DoT model, with its emphasis on self-reliance and openness, and its opposition to bureaucratic secrecy, also enjoyed popular support. But user groups were much less powerful than the DoT bureaucracy and domestic businesses that opposed restructuring. That the state was able to restructure at all was largely due to the political opportunities that helped it leverage the support it had and use it to thwart opposition.

3) Opportunity

Political opportunity opened up a space for the state to negotiate with different interest groups in order to carry through the change, while inflicting the least damage on its own interests and legitimacy.

There were at least two things that happened in the 1980s, that gave the state the political opportunity to push through restructuring even to the extent that it did. The first was Rajiv Gandhi's ascendance to power as the Prime Minister of India in 1984. Rajiv Gandhi's entry into politics was precipitated by

[14]For example, DoT placed an order to import switches from Alcatel even as C-DoT was developing a switch for the same purpose [9].

[15]It helped that C-DoT had not yet delivered a 16,000 line MAX-L switch that it had been scheduled to deliver in 1987 even by 1990 [8].

[16]Ref.[8] mentions that the scientist community saw the delay as natural and argued that MNCs typically took even longer to develop similar switches.

[17]These allegations were eventually never proven.

[18]As part of the mission, Pitroda also addressed the sensitive question of labor productivity in the telecom sector[10]. After negotiations spanning months, DoT trade unions agreed not to recruit more people in the coming years and DoT agreed to improve the training it provided its personnel in order to improve services.

[19]17,000 PCOs were opened by 1990 [8:153].

[20]The sensitive issue of labor productivity within the DoT created many problems in the restructuring. The creation of corporate style MTNL and BSNL also caused trouble since their work culture and incentive structure differed from those in DoT.

the assassination of the previous Prime Minister, and his mother, Indira Gandhi, in 1984. Rajiv had no experience with political power when he became Prime Minister. He represented 'political discontinuity' and promised 'economic discontinuity' [9:178]. His cabinet of ministers had a technocratic background, with many having worked in the corporate world or IFIs such as the World Bank. Gandhi and his cabinet passed a host of measures, including tax cuts, easing regulatory hurdles and telecom reforms, as soon as they came to power. This won them the support of the business classes, urban professional and urban salaried classes. The urban classes were

> enamored by an urbane Prime Minister, who promised to rid the political culture of corruption and nepotism and to take India into the 21st century by improving administrative efficiency with a computer culture. [9:178]

His alliance with Sam Pitroda, who

> fit the techno-nationalist vision of self-reliance, but with an added element of American entrepreneurial savvy,

brought telecom restructuring popular support [4: 237]. This support was leveraged by the state in crushing opposition from the DoT and allied interests. Predictably, when Gandhi lost the elections and Pitroda his political backing, the DoT interests could no longer be kept in check. Policy change that dealt with the restructuring of the DoT came to a halt.

The second opportunity that the state picked up on was the ITU's influential Maitland report in 1984 that condemned 'the extreme inequalities of telephone access between rich and poor nations' and drew attention to the fact that 'two-thirds of the world's population had no access to telephone services' (ITU 1984). The report identified telecommunications as the 'missing link' in the developing world [12:180]. It offered

> a new recipe for modernization: an urgent reform of inefficient public monopolies and the transfer of technologies from advanced to developing nations [4: 227].

Further, the report argued that 'telecom should no longer be seen as a luxury for elites, but rather as an essential service that directly leads to economic growth.' Following the Maitland report, other development agencies and financial institutions, particularly the World Bank began

> to promote the liberalization of infrastructure, and the privatization and commercialization of services through a series of conferences on telecom reform as well as through direct intervention in national policy formulation and implementation [4].

The Maitland report had a profound effect on the telecom for development discourse and it legitimized the changes the Indian state wanted to make, thereby giving it the leverage to negotiate changes with interest groups that opposed the change.

Besides making the point that motivation works only in combination with capacity and opportunity, the story of telecom restructuring in India in the 1980s also suggests that discourses played an important role in motivating and legitimizing change. Thus, it was not only material political and economic factors that allowed the state to legitimize its focus on telecom access and revise its earlier model of telecom production. Nationalist ideologies of self-reliance, and the international discourse on telecom for development, especially the Maitland report, proved crucial in the process of policy change.

C. The 1990s- From telecom production and access to telecom access for development

The decade of the 1990s saw a transition from the state's twin focus on telecom production and telecom access to a narrower focus on mainly telecom access as a development tool. The state's motivation for this change arose partly out of India's macroeconomic condition in 1991, which then led to economic reforms and liberalization of several sectors, including telecom. The liberalization of telecom production effectively killed local telecom production, especially since C-DoT was on a decline at the same time. The goal of telecom access, on the other hand, flourished. Similar to the 1980s, the state's proposal to make policy changes in telecom production or access was supported and resisted to different extents by different interest groups, including the bureaucracy, user groups, and the private sector. Finally, political opportunities dictated how the state fared with respect to policy changes in the two domains of telecom production and access.

1) Motivation

The government that came to power in India in 1991 inherited an economy that was on the brink of a collapse [8:167]. In May 1991, the country faced an acute Balance of Payments (BoP) crisis and had just a week's worth of foreign exchange to cover its import bills and debt obligations. India was at that time the third largest debtor nation with a foreign debt of $70 billion. The GNP growth rate was a miserable 1.25%. In order to secure a $2 billion loan from IMF, India had to institute drastic economic reform measures in a short period of time. This move had implications for the telecom sector.

One result was that the Indian telecom equipment market was liberalized. In 1993, AT&T, Siemens, Alcatel, Fujitsu, Ericsson and Alcatel launched 51% foreign-equity-owned joint ventures to produce large switching systems [8:175]. Domestic manufacturers continued to manufacture smaller switches for the national market. Obtaining foreign equipment was in the interest of DoT and hence it did not resist this

attempt at liberalization.[21] Domestic manufacturers did try lobbying but proved quite ineffective [8:172]. With liberalization and especially with the decline of C-DoT, the state focus on domestic design and production of telecom equipment declined.

Even as the focus on domestic telecom production declined, three factors—pressure from user groups; pressure from foreign governments and institutions; and technological advancement—compelled the state to focus on improving telecom access both by allowing private players and by restructuring the state-owned telecom monopolies. While business groups, especially exporters, had been applying pressure on the government for quite some time to improve telecom services, India's BoP situation in 1991 gave them more bargaining power with the state. As the exporters' earnings became more important in the face of the foreign exchange crisis, their demands were taken more seriously. Rural users too started lobbying for telecom access. Many political parties that came to power at the provincial and higher levels between 1991 and 1996 represented rural interests [8:174]. As a result, these representatives needed to meet the demands of the rural population to maintain their political legitimacy.

In addition to the pressure from user groups, India faced international pressure to liberalize service provision at the earliest. Participation in the General Agreement on Trade and Tariffs (GATT), and later the World Trade Organization (WTO), institutionalized restructuring through the 1990s and left much less room for the bureaucracy or other interest groups to affect policy change [8: 172]. At the same time as it faced pressures to liberalize, India also faced pressure from international development agencies to expand telecom access in order to aid development.

The third crucial reason for contemplating telecom restructuring was technological advancement, especially the appearance of cellular telephony and data services. Since the DoT had only dealt with land-line telephones and had no experience with wireless telephony or data services, it felt the need to restructure policy in order to create new policies and regulations for service provision in these domains.

Through the 1990s, the Indian state's focus on improving telecom access intensified for all the reasons outlined above. Privatizing service provision was a gradual process and faced stiff resistance from the state-owned service providers. In 1992, private players were only allowed to offer 'value-added' services (e.g. Mobile services) at high prices.[22] Even for this, DoT demanded high upfront license fees and also imposed local content requirements on private players, i.e. they had to manufacture equipment locally.[23] By the time the licenses for mobile telephony in metros were awarded, it was 1994 [4]. Finally in 1995, cellular services were made available in the metros.[24]However, the incumbent state-owned provider was not required to interconnect with the mobile service providers, which greatly affected the popularity of the services. Later, when the incumbent was ordered to interconnect with wireless providers in 1996, it was at higher charges than within network calls.[25] In addition, all calls from one wireless carrier to another had to be routed through the incumbent's network. The pricing made cellular calls that interconnected with the fixed wire-line network ridiculously expensive for the carriers, especially compared to the ceiling prices that they could charge for service.[26] DoT also decided that the state owned corporations that offered land-line services in Delhi and Mumbai, did not have to obtain a license or pay a license fee [8] As a result, the state-owned corporations had an advantage over private players since they did not have to pay either interconnection charges, or license fees.

It was only in the latter half of the 1990s that service provision was more fully liberalized. Under pressure from India's growing software industry, the data service segment was opened up to private players [8]. In 1999, private providers of voice services were finally put on par with the state owned providers in the New Telecommunications Policy (NTP) 1999. The license fees were replaced by a revenue sharing model for the wireless players, though licenses were still required in order to operate [13:19]. Private provision was also introduced in the land-line and long distance service markets that had so far been monopolized by the state-owned provider [14] By 1999, basic service providers were allowed to provide Wireless in Local Loop-based mobility services.

Throughout this period, the state also maintained its focus on rural telecom access. Even as service provision was gradually opened up to private players, DoT stated that only a government authority would be interested in supplying services to rural areas and that no private service provider would be willing to operate in rural areas[8:174]. Till the late 1990s, telecom services in rural areas were provided only by the state. When private players entered the service provision market (first in cellular services and later in basic services), they had to abide by regulations that specified how they would serve rural regions (typically by contributing to a state fund that was then used to subsidize rural telecom or by agreeing that a certain percentage of their operations would be in rural areas).[27]

[21]The Rajiv Gandhi administration had stopped state-owned service providers from importing any foreign equipment in the 1980s, even in those cases where C-DoT took a long time to produce an alternative [8:157]. This often delayed their plans of network expansion and frustrated them. .

[22]DoT did not at that time see wireless services as potential competitors for basic land-line services [13 15].

[23]The revenue from license fees was to be used to subsidize rural services.

[24]The auctioning and licensing process for other cities took even longer and licenses were granted only in 1996. Services started in 1997 in these non-metro locations [13].

[25]DoT initially charged Rs 1.40 per minute, compared to a maximum of Re. 1 for local calls originating and terminating in their networks[13: 16].

[26]DoT imposed maximum monthly service fees on cellular licensees of Rs. 3000 for the deposit, Rs 156 for the monthly charge, Rs 16.8 for peak-period calls, and Rs 8.4 for standard calls [13]

[27]The contribution came from the one-time license fees paid by private operators in the beginning. Later, this rule was changed and private operators had to pay a share of their revenue to the fund. Also, DoT required basic service providers to have 10% of their coverage areas in rural regions as part

The Eighth Five Year plan (1992-1997) emphasized rural telecom and decided on a target of one pay phone per village through the village council or *Panchayat.* This was named the Village Panchayat Telephone (VPT).[28] Private phone connections in rural areas did grow in this period as indicated by Table I.

Table I:
Growth of Rural DELs and VPTs

Year	Rural DELs (millions)	VPTs
1995	1.367	185,136
1996	1.761	211,113
1997	2.159	267,832
1998	4.255	310,687

Source: DoT's Annual Reports, cited in [15]

However, VPTs were not accessible to all sections of the populations, especially women and those from the marginalized castes [15]. In addition, Jain and Sastry argue that

> this scheme was a failure since more than 50% of the installed phones did not work, large numbers did not have long distance calling and since there were no commercial incentives for villagers to ensure its working, several VPTs were disconnected due to non-payment [16].

The National Telecom Policy of 1994 mentioned 'universal access' for the first time. The focus once again was on public phones rather than on individual connections, especially in rural areas. The 1994 plan, said to be one part rhetorical and one part substantial, promised phone service in all 600,000 Indian villages by 1997 [8:176]. This was widely criticized as too ambitious, given that only 200,000 villages had phone service in 1994.

Sure enough, only 267,832 villages had service by 1997. NTP 94 proved too ambitious and most of its targets were not met. Meanwhile, rural user groups continued to demand services. In addition, telecom access was expanding to mean more than telephony and the telecom for development discourse was now morphing into the 'Information and Communication Technologies for Development (ICTD)' discourse. The World Bank was one of the first organizations that talked about using modern ICTs for development.[29] India did not remain unaffected by this discourse as reflected in telecom policy documents. Thus, where the NTP 1994 promised the installation of phones in all Indian villages by 1997 [8:176], the National Task Force on IT and Software Development promised 'IT for all by 2008' in 1998 [8:182].

NTP 99 was announced at the end of the second decade of telecom restructuring in India. It maintained NTP 94's rural focus, but took into account the failure of NTP 94 and technological advancements that had occurred since that time. Thus, NTP 99 revised the universal service objectives of the 1994 plan. It declared that rural telecom would be made more affordable by the adoption of suitable tariff structures and by making rural service provision mandatory for all basic service providers. It set a goal (eventually not realized) of providing telecom coverage to all villages in the country by 2002 [20: 54], [5:2]. Telephone connections were to be available on demand by 2002 in urban and rural areas. Rural tele-density was to be increased from 0.4% to 4% by 2010. All district headquarters were to be provided internet access by 2000 [5]. Wherever possible, NTP 99 said, PCOs were to be converted to 'Public Teleinfo centers' with ISDN service, remote database access and (access to) government information systems.

Public Teleinfo Centers were modeled on the successful PCO model of access, but the reference to data services and the multipurpose nature of the centers indicates that it was also influenced by the global discourse on telecenters. International development agencies had started talking about telecenters as an effective community access model in the mid 1990s although the first telecenters were set up in the early 1980s in Scandinavia.[30] In fact, India's PCO experiment was perceived by observers as a simple model for a telecenter [21: 3]. As development agencies started advocating the setting up of telecenters, the Indian state expressed enthusiasm for the idea and was even an executing agency for an ITU supported Multipurpose Community Telecenter pilot project scheduled for 1998. While it is difficult to establish when exactly the state started to back telecenter projects, NTP 99 was arguably among the first documents where the state formally expressed support for multipurpose telecenters.[31]

Thus, in the 1990s, the state focus on domestic design and production of telecom equipment declined following the

of their license agreement. This was never monitored or enforced [15]. In fact, the state owned provider too was guilty of not fulfilling this requirement, even as it claimed its high long-distance call rates were used to cross-subsidize its rural service provision. Also, because the DoT had a limited notion of 'basic services' as fixed line, it ignored a scenario where telecom services could be provided through wireless access and the 10% coverage rule on fixed line providers would be redundant.

[28]The Five-Year plans are a centralized way of planning economic growth for a limited period through the use of quotes. In India, the Planning Commission has been charged with the responsibility of making an assessment of all resources of the country, augmenting deficient resources, formulating plans for the most effective and balanced utilization of resources and determining priorities. The First Five-Year plan was launched in 1951and the first eight plans focused on growing the public sector, with massive investments in basic and heavy industries.

[29]It was only by the late 1990s that ICT access for development became a World Bank focus. For more on the World Bank involvement with ICTs, see [17],[18],[19], the World Bank website on the Bank's Global Information and Communication Technology (GICT) group, its 'infodev' project, and the 'Development Gateway' website supported by the Bank.

[30]For more on the the history of the telecenter movement, see [21], [22], [23] and [24].

liberalization of telecom equipment production and the parallel collapse of C-DoT. Access to telecom, on the other hand, become a top priority for the state in this period. The decade saw a great deal of restructuring aimed at improving access. Access in rural areas became especially important as a development goal. The telecenter model of accessing telecom emerged as a favored model with the state for providing a community access to telecom.

2) Capacity

Once again, the story of telecom restructuring in the 1990s indicates that motivation alone did not decide what policy changes were made. The Balance of Payment crisis provided the state great motivation to push through policy changes in telecom access. But even so, the state had to deal with several interest groups including the DoT bureaucracy, exporters, and urban and rural user groups before it could make policy changes in telecom access. As mentioned earlier, it was mainly smaller domestic players who resisted the liberalization of telecom production. The DoT did not resist the entry of foreign companies as much since it was interested in getting access to foreign equipment. It did resist the liberalization of service provision. The DoT was responsible for several delays in the privatization of service provision as described earlier. In addition, it opposed the setting up of an autonomous regulatory authority for the telecom sector. Thus, the state had to deal with the DoT as it made policy changes, especially in the realm of service provision.

At the other end were user groups (business users, urban and rural individual users) who pressurized the state to improve and expand telecom services. Urban business users wanted privatization of voice and data services, which they felt would improve the quality and efficiency of services. They lobbied "feverishly" through industry-wide associations for restructuring and privatization [8]. The software exporters' lobby in particular proved very organized and also had bargaining power with the state at this time because of the BoP crisis. Rural users on the other hand wanted the state to expand telecom access in their villages and lobbied intensely to achieve this goal. They also had bargaining power because of the high representation of rural interest among elected representatives at the provincial, state, and national level.

The DoT and user groups had conflicting interests in the domain of telecom access and service provision. The different user groups themselves had differing expectations from the state, with business users lobbying for value added services and rural users focusing on basic telecom access. All of them had some level of bargaining power with the state, though each appealed to different interests within the state. The state's capacity to make changes was reinforced or constrained by these groups. Thus, the state had to juggle heterogeneous expectations, its own search for political legitimacy and international pressures and expectations before it could make a policy change.

[31]State support for telecenters seems to have been growing ever since, with the state backing telecenter projects set up by NGOs, setting up its own and now the CSC scheme.

3) Opportunities

However, policy change did not depend just on the state's capacity in terms of the support or resistance it faced from different interest groups. As in the 1980s, political opportunity determined how the state could negotiate with different interest groups and maintain its own interest as well.

The immediate motivation for the liberalization of telecom production in this period was the BoP crisis. India had to prove that it was adopting economic reforms at this stage in order to secure loans from international institutions like the IMF. Since this was crucial for the state, opposition from small groups of domestic manufacturers did not carry much weight. As a result, the BoP crisis also provided the state an opportunity to restructure telecom production without much delay. The liberalization of service provision was much more contested. However, the resistance decreased through the 1990s as the restructuring became progressively institutionalized by India's participation in the WTO. This "weakened the Indian bureaucracy's or politicians' capriciousness and favoritism" [8: 172]. The WTO provided the state a tool to restructure telecom service provision even in the face of resistance.

Besides material conditions, development discourses also provided the state an opportunity to justify and negotiate the policy changes it was trying to bring in. On the one hand, the liberalization discourse (along with finance ministers who were liberal economists educated in western institutions) encouraged India to liberalize its telecom sector. On the other, the continued international focus on telecom access for development encouraged the state to focus on telecom access, especially through the use of telecenters, as a development tool. The telecenter model was especially useful for the Indian state since it also worked well with India's homegrown PCO model. Thus global development discourses and national experiences worked together to create an environment in which the state could emphasize telecom access through telecenters as a development tool.

IV. Conclusion

In this paper, I traced telecom restructuring in India to understand the shift from telecom production to telecom access as a development tool in Indian telecom policy. The process of telecom restructuring took the Indian state from a complete focus on telecom production for development (pre 1980s) to an era where it tried focusing on both production and access concerns (1980s). Finally, in the 1990s, it focused primarily on telecom access as a means to development.

I have argued based on the Indian telecom policy case that transitions in priorities and policies did not result merely because the state was motivated to make these changes in order to achieve political legitimacy. Instead, change was determined by the state's capacity (what interest groups supported and resisted the change) and the presence of political opportunities which opened up spaces for the state to successfully negotiate with interest groups, without harming its own interests. I also contend that prevalent development

discourses, both domestic and international, were at least as important as material conditions in motivating or legitimizing change.

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