

Telecom, national development and the Indian state: a postcolonial critique

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For postcolonial nations, the negotiation of telecom policy must be seen as more than a problem of the absence of institutional, technological and economic resources. These absences are very real impediments, but they do not in themselves hold the key to solving the 'development problem'. Instead, I argue that we need to account for the specific ways that the market and democracy have unfolded in these societies, sometimes defying and at other times reproducing Western modernity. Although this article is based on the empirical case of India, my main concern is to establish that the politics of telecom reform in the developing world as a whole needs to be understood beyond the singular issues of access.

Telecom became a national development priority in Africa, Asia and Latin America in the 1980s when global attention turned to the growing disparity between the First and Third World. In 1984, the International Telecom Union (ITU) released its influential *Maitland Commission Report* condemning the extreme inequalities of telephone access between rich and poor nations. In drawing attention to the fact that two-thirds of the world's population had no access to telephone services, the report offered a new recipe for modernization: an urgent reform of inefficient public monopolies and the transfer of technologies from advanced to developing nations. The ITU 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. The World Bank in particular 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 (Wellenius et al., 1993).

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This literature formed the foundation of a new discourse of ‘telecom for development’ that continues to dominate the terms of debate in global policy circles. While multilateral organizations, transnational corporations and ever-increasing numbers of domestic technocrats – trained predominantly in US business and law schools – have formed a consensus about the relationship between telecom and national development, competing discourses of national development pose a challenge to reformers eager to ‘leapfrog’ into the information age.

One of the most controversial examples has been the case of India. The telecom network has expanded since the mid-1980s with dramatic policy shifts taking place in both 1994 and 1999. However, the terms of reform have been contested in the political arena at every turn. Policy-makers and business leaders alike bemoan interference from ‘vested interests’ as their plans for ‘information superpower’ status through the rapidly growing software export sector are derailed by tele-density rates just under 4 percent and the spectre of declining investor confidence in an already soft global telecom market. The reform process has been mired in political controversy, ranging from on-going labour disputes, a large-scale corruption scandal over the selling of basic service licences in 1996 and a series of public interest litigations against the state’s handling of the terms of reform (Chakravarty, 1999). In the business press, India’s democracy is repeatedly cited as the cause of the nation’s failure:

Among Asia’s two largest economies, India is now a distant No. 2 to China. Just why that has happened is now a favourite parlour topic among business leaders and policymakers in Bombay, Bangalore and New Delhi. During a recent trip to India, I heard people blame India’s democracy, with coalition governments unable to act quickly, and compare it unfavourably with China’s authoritarianism. (Einhorn, 2002)

Industry analysts and social scientists interpret the unresolved policy process now entering its 17th year of reform, as an unfortunate by-product of the democracy and development nexus (Chowdhary, 1999, 2001; Singh, 1999). India’s democratic political culture thus poses a challenge for policy experts who increasingly recommend further insulating the technical policy process from broader political interference (Cowhey and Richards, 1999; Petrazinni, 1996).

Researchers writing about the Indian context from a more critical perspective have argued that political from civil society might actually help protect public interest by expanding the democratic policy-making process (McDowell, 1997; Mody, 1998). Along with these researchers, I contend that the process of telecom reform in India is an interesting arena in which

to study a wider range of institutional actors contesting public interest. However, I argue that the messy politics of telecom reform in India continues to be perplexing without reference to the postcolonial history that shapes the particular experience of an inherently fractured transition to the current global information age.

My specific concern in this article is to examine how the discourse of 'telecom for development' has clashed with competing discourses which critique Western modernity in the context of the postcolonial Indian state and its changing relationship to science, the market and national development. I draw from recent postcolonial theories to argue that historically rooted discourses on the role of technology in national development shape current policy debates over telecom reform in India. The following historical analysis uncovers unresolved tensions between a Gandhian versus Nehruvian debate around technology, the role of the state and market, and the limits of Western modernity. We also find the central role of a lesser-known figure in the West, Ambedkar, and his influence in shaping national development and employment policy through affirmative action around caste. These tensions provide a language and counter-language for discussing technology and national development in postcolonial India that continue to find resonance in civil society, and deeply inform either side of the volatile political negotiation of telecom reform.

The main focus of the article is the initial period of reform in the 1980s, when telecom first became a political issue, and therefore exemplifies how shifting discourses shape the public policy process. In order to make my argument, I contrast an earlier era of techno-nationalism when telecom was largely neglected with this shorter, significant era of techno-populism under the Rajiv Gandhi administration in the 1980s. Conceived only as a problem of economic development or institutional design, analyses of telecom reform rarely recognize the distinct experiences of the disparate information age in the Third World. In contrast, a historically grounded analytic focus will help us understand how the cultural legacies of the state – its linkages to capital, its particular vision of modernization, the ways in which it creates a state subject, and its failed historic commitment to redistribution – reconstitutes the very meaning of public interest, which is at the heart of debates over telecom reform. It is for this reason that this article steps back to examine the historical context of the current telecom reform drama, a subject of much recent scholarship.

This article is based on extensive archival research and interviews with over 100 policy-makers, politicians, activists and corporate actors in New Delhi, conducted during fieldwork in 1997 and again in 2000. I also rely on the substantial secondary literature on the telecom sector in India. In the next section, I begin by laying out how my argument relates to the debates about telecom and development within the communications literature.

Telecom and development: a postcolonial history

Theorizing telecom and development

The vast majority of academic writing on telecom policy is ahistorical and prescriptive (Lenert, 1998), and therefore fits coherently with the 'telecom for development' discourse. However, we can identify critical communications scholarship from two schools of thought that have examined the structural and institutional context of the recent spate of reforms in the developing world. Neo-dependency scholars like Jill Hills (1998), have written persuasively about how the interests of transnational corporations (TNCs) entering new markets on beneficial terms have shaped policy in the domestic and multilateral arenas, most notably the World Trade Organization. Hills (1990) also argues that the World Bank aggressively promotes its privatization agenda wherever its sister lending agency – the International Monetary Fund (IMF) – finances new loans. Hills and others consistently remind us that liberalization is likely to reinforce pre-existing structural information disparities domestically, as well as globally, by further diminishing the weak bargaining power of Third World states vis-à-vis TNCs domestically and multilateral regulatory bodies internationally (Hills, 1994).

We can identify a second group of neo-institutionalist scholars who have argued that the most significant flaw in the 'telecom for development' discourse is its assumptions about the neutrality of technology. They contend that the value of access to telecom is contingent on questions of power – between national and global interests, urban and rural interests, and intra-community class interests. These reformists recognize that the public telecom monopoly model has failed and focus instead on the importance of effective institutional arrangements that might lead to sustainable economic development (Samarajiva, 1997; Samarajiva and Shields, 1990). These studies concentrate on the means by which states establish an effective relationship between public and private corporations, and engage with vested stakeholders from civil society through a neutral regulatory agency capable of legitimately balancing the competing interests of the various institutional actors (Dokeniya, 1999; Mody, 1997, 1998; Samarajiva, 2000).

Introducing this kind of institutional arrangement is difficult, given that most Third World nations have 'no disinterested non-governmental organizations to advise them on telecommunication technology' (Mody et al., 1993: 270). In contrast to the 'developed world', the main stakeholders in the information periphery are governmental actors, corporate players (increasingly transnational giants), and policy brokers from multilateral organizations and foreign countries. The absence of genuine public interest stakeholders is explained as premature since these societies have yet to

'develop' interest groups around such luxuries as telecom technology when other more basic needs remain unmet.¹

The focus becomes the absence of regulatory autonomy and a civil society capable of providing a check on the growing linkages between the state and capital (Evans, 1995). In fact, both advocates and critics of 'telecom for development' seem to agree that the absence of institutional safeguards results in a predatory politics of populism that hinders a 'rational' policy process in the developing world (Petrazinni, 1996; Samarajiva, 1997). Neo-dependency scholars, with their focus on TNCs and multilateral institutions, present an even more pessimistic picture of growing structural disparity that leaves most Third World nations without much of a voice under globalization (Herman and McChesney, 1997; Mosco and Schiller, 2001).

In contrast, I argue that the power of TNCs and multilateral institutions, along with the failings of state institutions, should not be taken for granted simply because self-identified stakeholders do not constitute a critical mass within civil society in the developing world. Clearly, the neo-institutionalist and neo-dependency positions have much explanatory value in terms of identifying the structural and institutional features of reform in the developing world. Nonetheless, instead of contrasting what is *missing* from the 'underdeveloped' policy environment in relation to the West, it might also be useful to engage with what is present – or the specific historical trajectory of the postcolonial state and its particular relationship to modernity. The politics of telecom reform in the developing world is unlikely to follow the trajectory established by the US, the UK or even Japan. So then, how should we think about telecom and national development in a postcolonial society?

Without abandoning the insights provided by structural and institutional analyses, I believe it is possible to productively engage with current discussions in a growing body of literature that falls into the category of postcolonial studies.² Historians, anthropologists and political theorists have examined the problematic relationship between development and modernity (Chakravarty, 2000; Escobar, 1995; Mamdani, 1996), and it is instructive to consider the implications of this work on studies of the communications industry, infrastructure and policy. This body of work has been provocative in questioning modernist assumptions about linear routes to development. But some of this work has also rightly been criticized for a failure to engage with the practical matters of distributive justice (Dirlik, 1994; Sunder Rajan, 1997). Taking a broader look at the obvious tensions between the study of development and postcolonial studies, Christine Sylvester has argued that 'development studies does not tend to listen to subalterns and postcolonial studies does not tend to concern itself with whether the subaltern is eating' (1999: 703). Nevertheless, like Sylvester, I believe it is fruitful to consider the intersections of postcolonial studies

with more traditional social science research from the structural and institutional perspectives.

'Industrialize and perish!': Gandhi's vision and telecom as luxury

Salient to this study, postcolonial theorists point out that the modernizing role of the state has been integrally connected to assumptions about the nation's social 'backwardness' in relation to the West. In India, the discourse of science and technology is pivotal to this language of modernity, introduced in the anti-colonial era and deployed to this day simultaneously to critique colonial power while putting forward an alternative indigenous scientific tradition. The postcolonial Indian state was heavily invested in a nationalist discourse of science that had a contradictory relationship with Western modernity. As Gyan Prakash notes, the 'spectrum of positions' that formed the limits of this discourse revolved around two of the most important figures in India's postcolonial history: Gandhi and Nehru. Economic development was marked by a series of negotiations and compromises between Nehruvian brokers of state-led industrialization and Gandhian critics of technological modernization (1999: 203).

Gandhi advocated an Indian ethics of austerity based on the moral economy of the village, as a corrective to Western theories of modernization. In contrast, Nehru advocated a state-led development agenda that combined science and community in opposition to the inequalities inherent in Western industrialism. While the two held opposing positions about the road to modernization, both were fierce critics of Western modernity and envisioned instead a nation that could be 'modern without being Western' (Prakash, 1999: 231). The discourse of technology in postcolonial India revolved around Gandhi's vision of *swaraj* (self rule/self-reliance) and Nehru's vision of collective interests before individual profit. In contrast to Nehru's version of Fabian socialism, which saw in the Russian Revolution a model of technology-led development and progress, Gandhi emphasized manual work and a moral economy of Indian village life (Khilnani, 1997; Pantham, 1995).

Like many other postcolonial nations, India followed an import-substitution industrialization model of state-led capitalism. The 1950s through the 1970s were decades of massive public sector investment in large dam projects, steel mills and other 'temples of the future'. For a sector like telecom, the outcome of the competing Nehruvian and Gandhian visions was a combination of centralized state ownership coupled with long-term political neglect of everyday operations. The Indian telecom network was one of the oldest in the world and played an integral role, along with the railroads, in reinforcing colonial control over a vast territory

(Headrick, 1988). With independence in 1947, the postcolonial state took over the core economic sector and restricted it to state ownership, keeping much of the colonial legal and bureaucratic infrastructure intact. For nearly 40 years telecom services remained below the 1 percent mark in terms of tele-density.

The powerful Gandhian critique of technology as luxury was characterized as a Luddite perspective both during his lifetime and afterwards. Nonetheless, he is today seen as a prescient environmental visionary, both in India and abroad. The important issue for our purposes is to recognize that Gandhi's critique of technology and machinery, although severe and often set against essentialist notions of 'Indian' traditions, accepted that technology has the 'potential to improve the material conditions of human beings'. This emancipatory potential is not realized, however, because technology is usually designed to benefit the already powerful in society (Patel, 1995). For a nation where the vast majority of citizens live in poverty in rural areas, social policy dictated that public expenditure prioritize other infrastructure areas – such as roads and power, as well as social services like sanitation, education and health – over expanding telecom, which received only 2–3 percent of the total national budget allocation.

One of the main objectives of state-led development was that public industry should balance economic development with social equity. Since telecom services were understood as a luxury, balanced development did not lead to expansion of telephony. Instead, the state focused on the production end through attempts at technological self-reliance, encouraging regional development by setting up telecom manufacturing plants in economically underdeveloped areas. Telecom services were managed by a top-down chain of command under the Department of Post and Telecom (P&T), responsible to the Ministry of Communications. Within the constraints of a limited budget, a centralized bureaucratic board determined policy guidelines, technology standards and implemented expansion of the network at a modest pace. From the perspective of these bureaucrats, the state served the public interest by keeping local service and rental rates well below world standards and by using profits from telecom services to cover the operation of the labour-intensive postal sector, which was seen as a more basic development priority.

Caste and class and the telecom bureaucracy

While the overall telecom network expanded slowly, barely doubling the telephone density from the colonial era in 40 years, the bureaucracy grew extensively. The expansion – which accounted for one of the highest worker-per-telephone-line rates in the world – can be explained by another

important feature of the social equity policy: the provision of employment opportunities for marginalized castes, religious minorities and tribal groups.

This takes us to the third nationalist figure whose development vision profoundly shaped Indian telecom policy: Babashaheb Ambedkar. As a member of the *Dalit* community (a member of the 'untouchable' caste), Ambedkar was a legal scholar and advocate, influential in designing the Indian Constitution. While Gandhi was a vocal opponent of the abhorrent practice of untouchability, critics point out the seeds of Hindu nationalism in his vision of 'traditional' village rule. Similarly, Nehru's vision of state-led development has been criticized as a form of 'Brahmanic socialism' with high-caste 'priests' placed in positions of power in the economic and scientific bureaucracies (Bardhan, 1984: 58).

Ambedkar's anti-colonial vision presented anti-caste struggle as fundamental to India's emancipation from both colonial and indigenous forms of power (Ilahiah, 1998: 269–72). In effect, Ambedkar fought for constitutional intervention to protect the rights of the lowest castes by introducing an agenda of affirmative action for India's vast number of lower and 'backward' caste communities through public education and public sector employment (Galanter, 1997). Caste reservation policies stipulated that 15 percent of all bureaucratic positions should be reserved for the backward caste groups, and had significant effect in labour-intensive departments like the P&T where there was a rapid expansion of the number of jobs for lower-caste groups in the lowest rungs of the bureaucracy. Administrators and engineers made up 10 percent of the bureaucrats who managed telecom services. However, the visible face of the bureaucracy was the approximately 500,000 unionized workers who dealt directly with the public. Within this group, the Department of P&T provided tens of thousands of low-skilled jobs – half of the workforce in 1980 were non-literate – to socially marginalized groups, creating a bottom-heavy organization. Ranging from telephone operators, mechanics, office 'peons' and casual labourers, these were among the lowest-paid workers in the entire Indian public sector. The politics of caste left an indelible imprint on class formation in the telecom sector, and would influence both how workers and bureaucrats saw themselves, and how the heterogeneous Indian public would in turn see them over time.

'Industrialize or perish!': Nehru's vision of techno-nationalism

If the Department of P&T became a neglected bureaucracy, parallel bureaucracies affiliated with national security embodied the Nehruvian vision of science and national development. In contrast to the neglected Department of P&T, the Department of Atomic Energy, the Department of Aerospace Research and, later, the Department of Electronics, were

administrative domains of scientific national self-reliance. With direct protection from the Prime Minister's Office, research and development in these departments was given special privileges and shielded from public scrutiny, justified by concerns for national security (Nandy, 1996; Vishvanathan, 1985).

Nehru's daughter and successor, Indira Gandhi rose to power in the late 1960s, symbolically renewing her father's commitment to socialism by imposing new limits on foreign equity of firms, and restrictions on imported technology and investment.

I contend that this period of the 1960s and 1970s can be seen as an era of techno-nationalism, marked by several public experiments in 'conspicuous technology' (Nandy, 1996). These included the development of indigenized computer technology, the first nuclear explosion, the launching of a national television satellite broadcast and the development of the nation's first computer-mediated network, NICNET. The state's investment in self-reliance sought to use the legitimacy of science to mobilize the urban Indian middle classes. Certainly, the benefits of these kinds of technological innovations were extended in political discourse to include the 'masses' in terms of national defence and integration. Nevertheless, this potentially contentious rationale for prioritizing investment in science and technology – for example when issues of basic literacy, housing and welfare had yet to be addressed – remained firmly outside of the realm of public political discourse.

For the purposes of our discussion, the high profile of the Department of Electronics (DoE), responsible for India's indigenous microcomputer and software expertise, could easily be contrasted to the telecom department. Where the DoE was recognized as above the politics of patronage and guided by higher principles of science, the Department of P&T was one of the nation's oldest bureaucracies with a reputation for poor service and petty corruption. In 1965, the Department of P&T purchased virtually obsolete switching equipment from a foreign consortium, just as newer models were being introduced elsewhere and demand for telephone services was increasing throughout urban India.³ By the 1970s, the quality of services was deteriorating, hundreds of thousands of people were on waiting lists for telephone connections (700,000 in 1981), and less than 1 percent of all of India's 600,000 villages had access to telephones (McDowell, 1997). The colonial regulatory structure shielded the telecom bureaucracy from any form of accountability from an increasingly disgruntled public. The Department of P&T's problems were compounded by charges of petty corruption. Hundreds of thousands of subscribers on multiple year-long waiting lists, coupled with the department's large poorly trained and poorly paid workforce, led to chronic petty corruption – the practice of taking bribes for connections, and linesmen and mechanics demanding 'tips'.

By the late 1970s, there were moves by top scientists within the scientific bureaucracies to take a more 'pragmatic' attitude towards the market. In the next decade, reformers from the telecom sector would reinvent the Nehruvian 'science above politics' agenda, combining the discourse of techno-nationalism with the logic of markets.

Techno-populism: the missionary era of telecom reform (1980–9)

India witnessed a growing anti-statism in the public's response to 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 – including a burgeoning civil rights movement – 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 (Kothari, 1995: 157).

Indira Gandhi's administration set out to mobilize the support of the rising middle classes by expanding the communications sectors and reversing its previous policies of import restrictions. The state expanded the national television network, increased imports of consumer electronic goods like television and audio equipment, deregulated the advertising industry and allowed for the expansion of 'luxury' consumer goods from processed foods, and soft drinks to beauty products (Pendakur, 1990). At this moment, the historically neglected telecom sector became vulnerable to criticism for inefficiency and corruption as a bottom-heavy bureaucracy with shockingly low rates of telephone density. It is in this context that telecom reform would begin to develop a public profile inscribed in public debates by a populist anti-state, anti-caste, pro-market agenda that appealed to popular urban middle-class criticism of bureaucratic power.

Gandhian capitalism and the communications revolution

Various journalists and consultants whom I interviewed in New Delhi argued that the international 'telecom for development' agenda influenced their critique of the poor state of telecom services and its impact on the national development goals in the 1980s. The prominent national English-language dailies began to run editorials about telecom reform, encouraging private sector participation in equipment manufacturing and attacking the Ministry of Communications for neglect. The issue of labour productivity

and the political 'predominance of caste considerations' in hiring of staff in the Department of P&T were singled out as a 'root cause' of the rapid deterioration of services (*The Hindu*, 1 July 1981).

The Department of P&T felt suddenly under attack and responded by issuing statements defending its services, given budgetary limits. The Minister of Communications at this time went as far as to say that the performance of the Department of P&T had been 'admirable' if the public takes into account that these are the 'lowest-paid workers' in the nation (*Times of India*, 7 April 1981). When this failed to muster middle-class sympathy, political leaders went back to arguing that telephones were a luxury service and, as such, 'subscribers should return their telephones if they did not think their service was satisfactory' (McDowell, 1997: 134). It was clear that the Ministry of Communications was out of touch with recent political changes. Most significantly, the anti-statist, pro-market sentiment promoted a 'beyond ideology' perspective to economic governance, which clashed with the Nehruvian tradition of state-led development. Several top scientists contrasted efficiency with the baggage of socialist 'ideology' as the new development objective. As telecom consultant Dr Arthreya explained:

This is the way the country was before colonialism. British colonial rule and Nehru's Russian Socialism suppressed our entrepreneurial history. This is changing. (Interview with Dr Athreya, independent telecom consultant and author of several government-commissioned reports on the state of telecom, New Delhi, 20 September 1997)

By 1981, the logic of self-reliance for domestic strategic capabilities was being challenged by a new understanding of the nation's untapped potential as a player in the growing global software market.

It was at this moment that Sam Pitroda, a Non-Resident Indian (NRI) businessman from Chicago and self-made telecom millionaire, entered the Indian arena, proposing a novel scheme around a state-of-the-art digital switching system to Indira Gandhi's administration. Pitroda argued that the vast Indian village economy needed small rural exchanges that developed countries had little use for, and therefore called for greater investment in research.⁴ Given the spiralling costs of technological innovation, India could make significant savings (some 50 percent) if it were to develop indigenous network equipment and software. This was a clear attempt to distinguish a reform agenda in terms of 'appropriate' technology as opposed to 'conspicuous technology' (Nandy, 1996) in order to legitimate the goals of high-tech development in India's new market-oriented society. Pitroda's argument fit the techno-nationalist vision of self-reliance, but with an added element of American entrepreneurial savvy. Like the previous era of techno-nationalism, the new discourse of techno-populism drew from the competing Gandhian, Nehruvian and Ambedkarite visions of modernity.

However, in this formulation, the Gandhian critique of telecom as an urban luxury was now turned on its head with new proclamations by reformers who claimed that access to telecom was 'the great social leveller . . . second only to death' (Pitroda, 1993).

Telecom reform: of markets and missions (1984–9)

The assassination of Indira Gandhi unexpectedly brought a politically inexperienced Rajiv Gandhi to power as Prime Minister in 1984, promising a 'new era of Indian politics' based on 'freer economy' and an emphasis on rapid technological modernization. The 'modern' Prime Minister was embraced by both the Indian and Western media, which dubbed him the 'Ronald Reagan of India' (Bhagwati, 1993: 79). His most public priority became modernizing and liberalizing the nation's communications industries. Very quickly, Rajiv Gandhi deregulated the computer industry and created the first Software Technology Park in Bangalore – India's designated Silicon Valley – to facilitate software export. In the mid-1980s, television penetration grew rapidly, with the estimated audience increasing from 30.3 million to 216 million, or reaching 25 percent of the population (Chakravarty, 1995). These changes created an unprecedented public profile for discussions about the relationship between new communications technology, development and modernization. Official government policy promoted the notion that cultivation of new communications technologies would enable the nation to 'leapfrog' the Industrial Revolution directly to the information revolution. In fact, the administration suggested that the old nationalist symbol, the *Chakra* (cotton loom), on the flag representing India's autonomy from colonial rule should be replaced with the new symbol of national potential, the computer chip.⁵

The new managerial approach to governance was meant to speed up the pace and reach of development while eliminating the age-old problem of corruption. This techno-populist discourse initially mobilized urban middle-class enthusiasm, but would ultimately fail to muster a broader base of support. After two years in power, the administration was plagued by a massive corruption scandal – the Bofors arms scandal – that unleashed a new political challenge to Rajiv's high-tech vision of development. V.P. Singh, the leader of the left-of-centre *Janata Dal* Party, vowed to fight corruption by directly challenging Rajiv Gandhi's 'upper-caste' technocratic vision. The opposition appealed directly to the politicization of the growing 'backward-caste' interests who were a very different constituency to the urban middle classes supporting Rajiv's mandate.

As the legitimacy of the 'computer revolution' was being questioned, the government responded by intensifying its campaign to bring technology to the 'people'. While the relevance of computerization might have been

remote for the majority of non-literate Indians, public access to telephony was embraced by the administration with 'missionary' zeal. Telecom was targeted as one of six science and technology 'mission' areas along with more traditional 'development' concerns like rural drinking water. The fact that telecom, understood until the 1980s as a luxury service, was suddenly redefined as a national priority along with drinking water and adult literacy, clearly demonstrates the administration's strategic attempt to broaden its high-tech mandate.

As his personal friendship with Prime Minister Rajiv Gandhi intensified, Sam Pitroda was placed in various bureaucratic positions of power in the reform process. Wanting to make telecom services the most tangible sign of the average citizen's claim to the information revolution, he wrote:

I began to see that information technology played an indispensable role in promoting openness, accessibility, accountability, connectivity, democracy, and decentralization – all the 'soft' qualities so essential to effective social, economic, and political development. . . . Telecom was as critical and fundamental to nation building as water, agriculture, health and housing, and without it, India's democracy would flounder. (Pitroda, 1993: 68)

In this way, the anti-colonial Gandhian critique of inappropriate technological investment was confronted with the promise of nationally designed technology that served the needs of the poor. Telecom 'lies at the very heart of progress', argued the new missionaries, because access to services would give the common person access to democratic participation: 'people must be able to reach out to government, media, institutions, and allies if they are to make their voices heard' (Pitroda, 1993: 76).

Following many of the assertions of the 'telecom for development' school of thought, the Indian missionaries linked education and employment opportunities and the basic rights of citizenship to access to telecom. Unlike the multilateral agencies, the Indian agenda for reform promoted national self-reliance against the interests of transnational corporations. This time, the issue was not national security but rather the interests of the 'average customer'. As G.B. Meemamsi, one of Pitroda's main bureaucratic allies, explained to me in an interview:

Hardware changes every three years when technology changes. The life of an exchange is 15 years. Multinationals want changes faster. This is the problem of all developing countries . . . in all of this, the customer is the most important thing. The customer doesn't care if it's imported or domestic technology. They want a telephone connection . . . we have to keep in touch with the market, and R&D should be tuned to that. (Interview with G.B. Meemamsi, Executive Director of C-DoT, New Delhi, 11 September 1997)

The emphasis on appropriate technology, self-reliance and the central role of markets marks a clear break from the earlier Nehruvian agenda, but this is obviously not a case of simple mimicry of the World Bank's position.

Meemamsi and Pitroda were appointed the Executive Director and Principal Adviser respectively, of the Centre for Development of Telematics (C-DoT). Created by direct orders from the Prime Minister's Office in 1984, C-DoT was given 'Rupees 360 Million and 36 months' to 'modernize' the national telephone system (Meemamsi, 1993: 27–9). The organization of C-DoT also reflected a new emphasis on the guiding principles of the market and an 'egalitarian' work culture invoking a distinctly American management ethos. As Pitroda explained:

Part of our mission was to inspire a whole 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. . . . I cheered people on, knowing as I did that young Indians did well in the United States. . . . I was almost brutal in my determination to root out hierarchy and bureaucracy. (1993: 73)

C-DoT spokespeople regularly 'went to the press' with news of reforms and technological progress. The journalists I spoke with remembered that C-DoT – which received a great deal of coverage in the English national dailies – positioned itself against the unpopular, postcolonial legacy of bureaucratic secrecy. This new emphasis on openness and Indian entrepreneurial capability played down the obvious tensions between the higher-end needs of business users – specialized data networks for the software parks – versus the basic telephony needs of the largely rural population. According to the leading policy-makers at this time, the priority for reforms would be 'local research and development to facilitate rural communications'. Only once the country was connected with basic services, would policy-makers consider newer technologies – cellular, satellite communications – and although the plan was to open up the equipment market gradually, the service market would remain as a state monopoly for at least ten more years.⁶

In January 1987, the Congress administration launched the 'Technology Missions' as a new public policy campaign. Sam Pitroda was appointed 'Adviser to the Prime Minister' for the entire Technology Missions project, bringing this former NRI businessman to the apex of the public policy process. Pitroda's media-savvy gestures like publicly renouncing his American passport in order to officially work for the government of India, instantly made him a public figure. One social commentator nicely captured Pitroda's peculiar combination of transnational nationalism and technological populism at the time:

Son of a carpenter, he is now a millionaire. But his is not the genteel mobility of the older types of scientists. . . . It is the spectacular leap-frogging of a self-confessed entrepreneur, committed to Schumpeterian breakthroughs into the system. He is the rarest of Indian breeds, the scientist as entrepreneur. . . . He carries his new Indian passport like a flag. There is a technological machismo here and none of the namby-pamby debates about pilot plans . . . (Visvanathan, 1985)

Based on management principles of 'synergy' between organizations and a 'get it done' attitude within government, these missions were attempts to integrate private sector principles into the national bureaucratic agencies. The Telecom Mission was also meant to introduce computerization to all government agencies, as well improve the quality of urban services and expand rural communications through the introduction of digital exchanges. One of Pitroda's first objectives became tackling the politically sensitive issue of labour productivity within the newly formed Department of Telecom (DoT), separated from the Postal Department in 1985. In 1987, the government authorized a committee to review the Department's 'manpower needs' in light of rapid changes in technology. As a compromise solution, the three main trade union federations agreed to quadruple the number of telephone lines by the year 2000 'without adding new employees to the workforce'. In return, the DoT ensured it would improve its training and incentive programmes. This was a major change in policy for a public sector bureaucracy that had grown at a steady pace, providing lifetime employment for workers with very little training and relatively low wages.⁷

Pitroda and his reform team's aggressive attack on the status quo created deep resentment from long-time bureaucrats in the DoT. In his reflections on the 'Pitroda years', one former senior Department official stated bluntly:

I would hold him responsible for the failure of telecom development. . . . He's a salesman. He had a good vision of manufacturing, but he had nil knowledge about the Indian situation. (Interview with anonymous Department of P&T Officer, New Delhi, 3 March 1997)

It is not surprising that officers in the Department of Telecom (DoT) had their own ideas of addressing technology transfer and expansion of the sector. In 1987, the department announced a pilot project funded by the World Bank to introduce a cellular network in Bombay. The deal was awarded to Ericsson, and the DoT officers argued that they would be able to gain technological and organizational experience from this collaborative project. Pitroda, who had no official power within the DoT at this time, went straight to the press arguing that 'luxury car phones' were 'obscene' in a country where 'people were starving'. He claimed that this was a duplicitous strategy by a transnational company trying to get 'backdoor' entry into the Indian market (*Times of India*, 15 February 1987). Although the plan had already received permission, Pitroda's objections went straight to the Prime Minister's Office, and the project was immediately scrapped. Journalists, keen to expose corruption associated with Rajiv Gandhi's administration, pointed out that Pitroda had, through his own company based in the US, introduced cellular technology to countries like Brazil in the early 1980s. And it was not long before sections of the media claimed that Pitroda's opposition to the Ericsson deal had to do with his allegiance

to other corporate players, raising the issue of corruption for the first time in this missionary era of reforms.

Ignoring these accusations, Pitroda's energies turned to preventing corporate entry into the network equipment area. While C-DoT's efforts against encroaching foreign firms was given extensive coverage in the business pages of national newspapers, a more modest project to expand access to public payphones throughout the country would become the most visible sign of telecom reforms for the vast majority of 'common users'. In 1988, a joint project between the Telecom Mission advisers and the DoT introduced a new 'scheme' to franchise the operation of payphones in order to both expand services and generate employment. Unsurprisingly, both Pitroda's 'missionaries' and DoT officers take credit for the initial idea.⁸ Instead of coin-operated public payphones that suffered from mechanical failures, and card-operated systems, which would prove too expensive for the Indian market, the 'STD booths' offer local and long-distance phone service, using meter devices operated by individual owners to gauge the phone calls. In Pitroda's colourful description:

. . . [we] put these phones into the hands of entrepreneurs who set them up on tables in bazaars, on street corners, or in cafes or shops whose owners feel they attract customers. . . . Today, the small yellow signs indicating a public telephone can be seen all across India. (Pitroda, 1993: 78)

These 'entrepreneurs' were actually groups targeted through the state's affirmative action policies – handicapped persons, war widows, 'backward' classes, as well as retired DoT staff – who would receive commission from the cost of the calls. Although a seemingly modest accomplishment by the technological standards of the day, the STD booth phenomenon has truly transformed the communications landscape in urban, and increasingly rural India.

The missionary era comes to a close: laying the groundwork for globalization

The Rajiv era, which began with a discourse of techno-populism that aimed to combine market principles with an apolitical technocratic modernization agenda, had come to an end with a massive corruption scandal. In 1989, the Bofors arms scandal, which had begun to chip away at Rajiv's public support earlier, exploded with another series of revelations implicating the Prime Minister's family. In December 1989, V.P. Singh and the *Janata Dal* Party formed a minority coalition government and his administration attempted to pass the controversial Mandal Commission recommendations that would have reserved almost 50 percent of all government and educational positions for religious minorities and lower-caste groups. This

was a politically explosive issue in India's fragmented democracy that was beginning to see the rise of upper-caste backlash in the form of the Hindu nationalist *Bharatiya Janata Party* (BJP) in opposition to the growing presence of lower-caste groups and political parties (Illiaiah, 1998). In 1990, the politics of caste were coming back to haunt the postcolonial secular state with a modern vengeance.

The techno-populist discourse tried to mobilize the masses promising modernization on behalf of 'the people'. The new technocrats spoke of the radical potential of communications technologies appealing to non-hierarchical market mechanisms – the village entrepreneur having power over the Brahmin bureaucrat – but the goals of high-tech development were inherently contradictory in India's disparate information economy. Access to telecom was meant to be seen as the common person's claim to the information revolution, and yet the lack of participation of the 'common person' in the process of reforms – for example the lack of popular participation in defining the goals of the Telecom Missions – served to delegitimize the state's grand gestures. Various critics perceptively pointed out that the techno-populist discourse of 'taking technology to the people' was rooted in an older elite bias that 'had little or no contact with the basic social reality that constitutes India' (Kothari, 1989).

Pitroda's imaginative efforts at promoting indigenous research and development in telecom equipment, and the significant growth of new communications infrastructure and services, only affected a tiny segment of the nation's working and voting public. The administration's emphasis on modernization through the 'computer revolution' left fundamental questions about the alleviation of poverty and redistribution through the state visibly unaddressed.

Meanwhile the debate on affirmative action raged across the country; the main DoT trade union federations firmly supported the Mandal Commission recommendations based on their large constituency of lower-caste members (*DoT Annual Report*, 1990). The 'Mandalization' (caste identification) of trade unions would have lasting effects on the strategies of the DoT labour federations in the coming decade of further liberalization. Without Rajiv Gandhi in power, Pitroda's missionary reform agenda collapsed. His appeal to self-reliance would not be enough to ward off allegations of corruption that, although never proven, led ultimately to his resignation. Siemens, Alcatel, Ericsson and others began to develop their own plans for network equipment in India, praising C-DoT's technological ingenuity in the press while 'waiting in the wings' for official changes in policy to catch up with pressures from the domestic firms who wanted faster capacity than C-DoT's national efforts could fulfil.⁹ Although the telecom network expanded as a result of the reforms, demand for telephone connections continued to outstrip supply and the Indian urban middle classes now looked for globalized standards of goods and services.

Similarly, in the booming software sector, it was becoming clear that the state's discourse of techno-populism, with its emphasis on indigenous technology and rural telecom, was blocking progress in an increasingly globalized industry.

The 1990s would mark the decade of the fastest expansion and most substantial reform of the telecom sector. However, this process would be even more fraught with political controversy, representing new formulations of debates rooted in the competing discourses of science, the market and national development.

Theoretical implications of India's postcolonial legacy

To use Manuel Castells's language, disparity is clearly more acute in the information hinterlands than in the main axes of the global economy (1996). But this objective reality only reveals a part of the complex process of negotiating telecom policy that is rooted in unresolved debates about technology, development and national interest that are specific to India's postcolonial history. The story told in the preceding sections holds at least three larger lessons about the social meaning of technology in the postcolonial context, suggesting a way of recasting policy-making that allows us to more carefully consider the politics of policy-making. Specifically, we must take more seriously the role of cultural legacies, the complexity of the postcolonial state and the potential politicization of technical issues where there is a conspicuous absence of mass self-identified stakeholders.

First, this discussion shows the importance of historically rooted cultural legacies that structure the debates on policy as well as placing limits on policy practice. Some scholars in communications studies have begun to point to culture as both enabling and constraining social action (Miller, 1998; Streeter, 1996). This is precisely the argument put forward by postcolonial theorists, who have argued that the relationship between science and modernity was marked by whether India could be 'modern without being Western' (Prakash, 1999), or maintained that the manner of the modernizing Indian state helped to undermine the legitimacy of the state-led model of development (Chatterjee, 1998; Kaviraj, 1991, 1998). These legacies shape debates in India's fractured democracy as institutional actors wrestle with the contradictions of high-tech development in the context of wrenching poverty. These legacies also explain the continued importance of a national scientific agenda in India, and foreground why we saw a 'rehabilitation' of the market in the 1980s in reaction to the flaws of 'Brahminized socialism'. The missionary period of the 1980s was based on a hybrid vision of Gandhian entrepreneurialism that promised to correct the failures of Nehruvian development. While the officials and scientists who

headed the state bureaucracies were subject to public resentment because of their power, the majority of low-caste, low-wage and low-skilled workers who made up the visible face of telecom services faced urban middle-class anger from citizens who saw themselves as dissatisfied consumers. The skewed implementation of the Ambedkarite vision of caste-based affirmative action – where for example in telecom, reservation meant jobs mostly in the lowest rungs of the bureaucracy – fostered resentment and more radical claims on national development strategies from both sides of the splintered caste divide.

Institutional analysis, particularly in the area of telecom policy, has yet to consider the implications of taking cultural legacies seriously. Recent work in the history of technology has begun to address the importance of nation-specific languages for discussing technologies as causally important (Kumar, 1998; Prakash, 1999; Visvanathan, 1985). In the Indian context it is apparent that cultural legacies based on postcolonial negotiations of the relationship between science, the market and national development have tangibly shaped telecom policy in a way that affects outcome. Thus a second lesson we can draw from this study is how to understand the postcolonial state as a site of on-going struggle between competing visions of modernity, unlikely to replicate the modular Western policy environment. Even when we find that that the Nehruvian vision is ascendant, as by the mid-1960s, when a new nationalist culture of technology – techno-nationalism – emerged as a model for scientific bureaucracy, the influence of the Gandhian critique of appropriate technology and Ambedkar's vision based on affirmative action around caste shaped the growth of the telecom sector. The language of techno-nationalism drew a distinction between 'scientific bureaucracies in strategic defence-related sectors' that were insulated from 'political demands' from the 'politicized' bureaucracies like the Department of P&T. In the 1980s, the growing and vocal urban middle class was dissatisfied with the pace of development through state intervention, and was easily mobilized to support the strategic criticisms of the administrative failures of the state. The shift to techno-populism represented yet another re-negotiation of these competing legacies. The missionary strategy attempted to mobilize broader segments of the population to join the 'computer revolution' on terms that would serve the interests of village India. This hybrid appeal to Gandhian traditions and market logic was ambitious but short-lived, and faced opposition on the grounds of caste and privilege as a form of urban, upper-caste 'yuppie fascination with technology' (Bhagwati, 1993: 97).

Finally, the third lesson is that there are no 'pre-given' stakeholders that we can categorically identify or assume will emerge over time. Rather, these emergent identities are contingent on negotiations of historically specific discourses like those identified in this study. In this discussion, we saw how the 1980s era of telecom reform in India led to the rise and fall of

the techno-populist vision of development. In the 1990s, telecom reform became the centrepiece of the government's liberalization agenda and notions of public interest in relation to access to telecom services, employment opportunities in the high-tech sectors, accountability of state and corporate institutions, and local and national interest in the era of globalization, were articulated through formulations of culturally resonant discourses encountered in the past. The material outcome would be the increasing politicization of telecom reform throughout the 1990s – with the privatization of services linked to a massive national telecom scandal, a series of strikes by organized labour, a series of public interest cases launched by civil rights groups, regional rights groups and others, and so forth.

In India, the on-going debate on telecom reform includes institutional actors from corporations, bureaucracies, political parties, multilateral bodies and activist organizations. But the negotiation of policy – between the values of telecom for development versus competing visions – is not contained in the institutional arena of policy-making. Instead, the narrow discussions over technical policy spill over to the wider political debates about appropriate technology, caste factors, corruption, self-reliance and foreign control. Beginning to locate these debates historically is crucial to making sense of the material ramifications of the increasing politicization of telecom policy as postcolonial nations like India enter the global information age.

Notes

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1. Robert Horwitz (2001) has shown that South Africa is an exceptional case where the African National Congress implemented a debate on telecom reform including stakeholders from labour, public interest groups, etc. However, the impact of the participation of civil society in the policy-making process lessened significantly once the ANC instituted a liberalization package in the latter half of the 1990s.

2. Recently, scholars within communication have argued for the need to engage with postcolonial theory. See Shome and Hegde (2002).

3. This was the Penta-Costa Crossbar from Alcatel (interview with Mr Ramachandran, former Department of P&T official and Member of the Telecom Regulatory Authority of India, New Delhi, 18 September 1997).

4. Telephone interview with Sam Pitroda, Head of WorldTel, London (1 April 1998).

5. Interview with Jairam Ramesh, Officer in DoT, and Ministry of Finance, New Delhi (25 July 2000).

6. Telephone interview with Sam Pitroda, Head of WorldTel, London, (1 April 1998).

7. Interview with O.P. Gupta, President of the National Federation of Telecom Employees, New Delhi (15 September 1997).

8. Advisers working closely with Pitroda, as well as officers in the Telecom Board in the DoT, claimed that the STD idea originated from their research, while C-DoT officials argued that it was their idea based on the successful village experiments. In either case, it is quite surprising that it took until 1989 for this basic public telephony franchise to be designed in a country where the vast majority of users are dependent on public call offices.

9. Interview with G.B. Meemamsi, Executive Director of C-DoT, New Delhi (11 September 1997).

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