

Research Article

Deploying ICTs for Development: An Evolutionary Perspective

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Abstract

As contemporary ICTs (information and communication technologies) become increasingly powerful and affordable, deploying them to improve the lives of the underprivileged is alluring. While the literature has mostly focused on investigating the efficacy and outcomes of ICT deployments in diverse domains, this article situates such deployments as a socially, spatially, and temporally specific outcome within shifting conceptions of development, from capitalist economic expansion to poverty eradication and inclusive growth. By so doing, the article explains why ICT deployments possess the characteristics that they do. The article highlights not only the novelty of ICTs, but also why deployments seek new forms of innovation (frugal innovation) and partnerships (which bring together historically antagonistic players such as multinational enterprises and nongovernmental organizations) in a quest to include hitherto-excluded populations (at the bottom of the pyramid).

Introduction

In the aftermath of the fall of the Berlin Wall, Fukuyama (1992) provocatively argued that the disintegration of the Eastern bloc represented the “end of history” (i.e., the triumph of Western liberal democracy as a universal political system and of capitalism as the dominant mode of production). However, Fukuyama (2002) chose to rethink his thesis when he claimed there would be no “end of history” as long as science and technology continue to advance. Further, how these advances are deployed determines the trajectories of innovation and the character of our economies and societies.

Indeed, in the nearly quarter century since Fukuyama offered his thesis, capitalism is not what it was a quarter century prior to the thesis. One difference can be attributed, in no small measure, to the effects of the commercialization of the Internet around the time that Fukuyama offered his thesis and to the proliferation of increasingly powerful information and communication technologies (ICTs) since the 1970s (Parthasarathy & Lage, 2010). As general-purpose technologies (David, 2000), ICTs have unleashed innovation, not only opening up new domains of activity, but also transforming the division of labor in existing domains of activity (Walker & Storper, 1989). With ICTs also being characterized by declining marginal costs of production, much hope has been vested in projects deploying them in various developmental domains such as agriculture, education, health care, and poverty alleviation to improve the human condition, especially in resource-constrained contexts. Although many evaluations of such projects suggest that the outcomes are mixed (for example, Heeks, 2003; Toyama, 2015), they nevertheless indicate that ICTs are being deployed to ensure that the “end of history” is not nigh.

A second difference is that, until recently, development was understood as capitalist economic growth,

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whose unfolding logic “creates uneven geographies of accumulation” (Rangan, 2008, p. 564). As Arrighi (2009) argues, new geographies of accumulation result as capitalism has historically moved from small “containers” to bigger “containers,” seeking a “spatial fix” to overcome the periodic crises it faces. This movement used to be between countries that were relatively wealthy with low population densities. Now, however, the movement is to large “civilizational states” that have relatively poor and dense populations, such as China and India. Indeed, since the late 20th century, efforts to promote free markets and international trade to propel economic growth, combined with ICT advances, have fostered an informational capitalism organized around a global economy, which operates as a unit in real time on a planetary scale (Castells, 2000). But as capitalist expansion continues, Unwin (2009) describes how, over the last quarter century, the “end of history” rhetoric has been accompanied by a shift in the understanding of development as poverty elimination based on absolute definitions of poverty.¹ For instance, the United Nations Sustainable Development Goals (SDGs) were adopted in September 2015 to address poverty by harmonizing economic growth, social inclusion, and environmental protection.²

It is to situate ICT deployment as a socially, spatially, and temporally specific outcome amid changing conceptions of development that Section 2 traces the unfolding of three industrial revolutions. In doing so, it highlights how technological change and innovation, amid changing institutional conditions, have driven the sociospatial expansion of capitalism. Section 3 explains why globalization and poverty elimination have especially focused on the bottom-of-the-pyramid (BoP) population. The BoP refers to an estimated 4 billion people who earn less than US\$2 a day, found mostly in the Global South (Prahalad, 2009).³ In addressing the needs of the BoP, one of the UN Millennium Development Goals (MDGs), which were adopted in 2000, was to develop a global partnership for development.⁴ Specifically, Target 8.F was a call to make available the benefits of new technologies, especially ICTs, in cooperation with the private sector. Similarly, one goal of the SDGs, which built on the MDGs, is to foster partnerships between the public and private sectors, and civil society at the global, national, regional, and local levels.⁵ It calls on the public sector to provide a vision and direction for development, by reviewing and monitoring frameworks, regulations and incentives.

To gain insights into partnerships, Section 3 examines how the private sector is attempting to address the needs of the BoP by shifting focus from the single to the triple bottom line of social, environmental, and economic objectives (Elkington, 1997). But even technologically endowed multinational enterprises (MNEs) with deep pockets can be challenged by the demands of the BoP, which is typically found in regions with low human development indices, where physical infrastructure is either unreliable or nonexistent. To address these challenges there has been a call for new models of innovation, especially *frugal innovation*.⁶ Achieving frugal innovation, however, has not been easy without an understanding of the needs of hitherto-ignored populations. It is against this backdrop that this article highlights emergent partnerships between MNEs and nongovernmental organizations (NGOs) as a way to understand and meet the needs of the BoP. Although MNEs and NGOs have long been antagonistic, circumstances are bringing them together. Since NGOs have their ears to the ground and understand the needs of underserved users, they can provide insights that

1. Unwin (2009) describes this shift in the definition, whose underpinnings are still economic growth, as being hegemonic among international donors. But there are other alternatives to this definition of development. A prominent alternative is Sen's (1999) capabilities model, which views development as the expansion of individual freedom in the personal, economic, political, and social spheres so that people can lead lives they value. While Sen's model offers “a more holistic view of development, scholars have been struggling to find a balance between its conceptual richness and its potential to be operationalized for development research and practice” (Kleine, 2010, p. 676). As a result, the influence of the model on international financial institutions such as the World Bank is limited.

2. <http://www.un.org/sustainabledevelopment/development-agenda/>

3. The Global South is used in this article as shorthand for the poorer areas of the world (i.e., as distinct from the Global North, which refers to affluent countries in general, and to North America, Western Europe, and Japan in particular).

4. <http://www.un.org/millenniumgoals/global.shtml>

5. <http://www.un.org/sustainabledevelopment/globalpartnerships/>

6. Frugal innovation draws inspiration from the term frugal engineering, which was first used in 2006 by Carlos Ghosn, head of the alliance between the automobile firms Nissan and Renault, to describe the challenge of designing in resource-constrained environments (Radjou, Prabhu, & Ahuja, 2012).

MNEs find hard to get otherwise, while the technical capabilities of the MNEs allow the NGOs to better serve the grassroots.

Section 4 explains why India provides a favorable location to understand how new organizational roles and practices are driving ICT deployment in the quest to meet BoP needs. As the world's largest exporter of software services, there is little doubt that India has the skills to address the challenge of deploying ICTs for developmental goals. The country is also an ideal laboratory because of its large and diverse population, which is poor, suffers from limited literacy, and gets by with inadequate infrastructure. India is also estimated to have the largest number of NGOs in the world that complement inadequate state efforts to serve this population. Recently, the state has provided a vision and direction for inclusive development through legislative and policy changes, which have enhanced the role of NGOs. As some NGOs have taken on new roles, they have also become more attractive partners for MNEs.

Section 5 provides two case studies of MNE–NGO partnerships in the domains of rural livelihoods and health and of education, before discussing the partnerships' mutual benefits and tensions. Section 6 reflects on the case studies and concludes by examining the value of providing a “top-down” and “long-run” view, as opposed to a project-based and “bottom-up” view, of the deployment of contemporary ICTs amid new conceptions of development and the social partnerships they entail.

Development as Capitalist Accumulation

Until 1400 CE China was the world's leading technological civilization, having mastered processes such as silk and gunpowder manufacture, and papermaking and printing (Mokyr, 1990). But technological leadership shifted with the European Enlightenment and the rise of modern science. While a scientific understanding of the world is critical to bring about technological change and industrialization, just as critical are the institutional conditions.

At least in Western Europe, these conditions manifest themselves with the replacement of feudalism by capitalism as the dominant mode of production (Anderson, 1974). Thus, it was the capitalist mode of production, with the scientific mode of inquiry, which led to the industrial revolution, beginning in the late 18th century. The industrial revolution deployed new technologies, replacing artisanal or craft production with mass production. Mass production needed large quantities of raw materials as well as mass markets to valorize its output.

The first industrial revolution, which ran roughly from the late 18th to the late 19th centuries, centered around Britain and was based on steam power, along with technologies such as automated textile machinery, railways, and the telegraph. The first industrial revolution solved the problem of markets with colonialism, viewing much of the noncapitalist world as destinations for goods and capital, besides incorporating them into the international division of labor as suppliers of raw material. Thus, Lenin (1939) referred to imperialism as the “highest stage” of capitalism.

The second industrial revolution, which extended roughly from the late 19th to the late 20th centuries, centered around the Ruhr Valley in Europe and the midwestern United States. It was based on electric power, along with technologies such as the internal combustion engine, flight, and petroleum refining. During this industrial revolution, colonialism began to run out as an option for raw material and markets. By the late 19th century, many Latin American colonies became independent, with Asian and African countries following in the 20th century. Thus, at least to cultivate mass markets, there emerged Fordism and the welfare state—a tripartite arrangement of state, labor and capital.⁷

7. Fordism was characterized by mass production, with vertically integrated firms catering to mass markets. Mass markets were created as capital and labor reached a pact, where capital was given control of the work process to ensure steady productivity gains. In return, labor was guaranteed wage increases, which, in turn, sustained the demand for mass markets. The Keynesian welfare state played a key distributive role—it mediated between capital and labor, provided appropriate macroeconomic policies to maintain the balance between productivity and wages, and supplied inputs such as education and health to ensure sustained productivity increases. This is the perspective of the Regulation School, which

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While Fordism and the welfare state led to economic prosperity in the Global North, especially after World War II, most colonies and former colonies continued to remain sources of raw materials. This led to arguments from scholars of the dependency school, such as Frank (1967), about the “development of underdevelopment” due to unequal terms of trade (i.e., the exchange of raw materials for manufactured goods). Political independence did not alter this state of affairs since the interests of the dominant classes in the former colonies, or the Global South, were closely tied with those in the industrial North. Yet, the arguments of the dependency theorists were discredited with growing evidence, especially from East Asia, about the possibilities of “late-industrialization.” Countries such as South Korea and Taiwan learned from borrowed technologies to move beyond low value-added production and substantially improve their living standards (Amsden, 1989; Evans, 1995). As Haggard (1990) succinctly put it, there were indeed “pathways from the periphery.”

Not all the paths tried proved effective. For instance, under the influence of the ideas of thinkers such as Schumacher (1973), efforts were made to break away from technological dependence on the North by developing “appropriate” technologies for the South.⁸ However, appropriate technologies that deemphasized technologies characterized by automation, scale, and capital intensity in favor of locally controlled, decentralized, labor-intensive, and energy-efficient technologies did not gain wide acceptance. Among the reasons was their limited technical transferability, weak institutional support (including insufficient funding), the challenges of distance and time in tackling rural poverty, and a perception that they were technologically inferior (Zelenika & Pearce, 2011).

Nor did dependency analysis fully apply to a group of countries that had withdrawn substantially from the world economy in favor of autarkic, public sector–driven, import-substitution–led industrialization policies. Post-independence India was a case in point (Sridharan, 1996). When the Indian economy began to liberalize and globalize in the late 1980s, inspired by the economic prosperity of its East Asian counterparts,⁹ it faced a world undergoing a third industrial revolution based on ICTs.

A microelectronics-based revolution in ICTs was triggered in 1949 with the development of the transistor. It blossomed most prominently in Silicon Valley, in northern California, with the development of the microprocessor in 1971, followed by development of the personal computer later that decade and commercialization of the Internet in 1993 (Parthasarathy & Lage, 2010). As ICTs have grown increasingly powerful, affordable, and versatile, “ICT” has become no more than a broad, fuzzy term that refers to everything, ranging from the technology, whether hardware or software, to the deployment of the technology for digitization and information processing in a range of application domains.

This new industrial revolution emerged amid a crisis in the welfare states of the Global North and the disappointing economic record in much of the Global South (such as in India) by the 1970s (Castells, 2000). These conditions created an intellectual climate for the ascendance of the Washington Consensus, which set aside statist development models in favor of free markets, private property, and individual incentives, and the liberalization of external trade and capital movements (Gore, 2000). A consequence of this shift was the push for an open international trading regime, institutionalized in the form of the World Trade Organization. The new trade regime was simultaneously facilitated by ICTs and, as mentioned in this article’s introduction, laid the foundation for an informational capitalism organized in a global economy (Castells, 2000).

sees capitalism as going through several phases of regulation. For a description of the school and its different strands, see Jessop (1990).

8. An example of an appropriate technology is the improved bullock cart developed in India. Since bullock carts play an important role in freight transport in the country, the improved cart was meant to carry heavier loads with less wear and tear on the bullocks (Auerbach, 1981).

9. The relatively slow economic growth in India created a vast informal sector and encouraged widespread *jugaad*, Hindi for local improvisation. *Jugaad* has come to be celebrated as a reflection of Indian ingenuity in conditions of scarcity (see, for instance, Radjou, Prabhu, & Ahuja, 2012). However, in contrast to innovations in the formal sector, the origins of grassroots innovations mean that the channels for their diffusion face significant challenges, including high transaction costs for scouting and documentation, the need for value-addition and finance, and ambiguous intellectual property rights (Dutz, 2007).

Partnerships for Development

ICTs have enabled the creation of an “informational, global and networked”¹⁰ economy capable of applying “its progress in technology, knowledge, and management to technology, knowledge, and management themselves. Such a virtuous circle should lead to greater productivity efficiency, given the right conditions of equally dramatic organisational and institutional changes” (Castells, 2000, pp. 77–78). But the informational economy has not reduced social inequity as it is highly selective in “connecting localities throughout the planet, according to criteria of valuation and devaluation enforced by social interests that are dominant in these networks” (Castells, 2002, p. x).

That the uneven geographies of informational capitalism are not very different from earlier manifestations of capitalism is evident in the wide variation in the diffusion and adoption of the Internet, which Norris (2001) highlights. Although the diffusion of many technologies has tended to follow an S-shaped pattern (slow initial adoption, a substantial surge that peaks when penetration levels reach saturation point, followed by a slow-down in demand), there is no a priori reason to believe that all organizations, groups, and locations will be part of the diffusion process.

In the case of the Internet, Norris distinguishes between cyboptimists and cybopessimists. The former believe that extensive diffusion will inevitably follow as the costs of connectivity and access devices decline and as network effects make the Internet too valuable to ignore. The latter, however, argue that those already well-networked with older forms of ICTs, including televisions and telephones, will prevail in the digital economy, especially in the absence of initiatives to overcome social stratification. Norris’ findings, from an analysis of Internet access in 179 countries, tend to support the pessimists. She shows that economic factors, especially per-capita gross domestic product (GDP), are the most important predictor of cross-national differences in Internet access. Since the same factors are also the best predictors of access to older forms of ICTs, she argues that Internet access is limited by entrenched socioeconomic conditions. More recently, Andrés, Cuberes, Diouf, and Serebrisky (2010) use data between 1990 and 2004 to explain differences in Internet diffusion among 214 countries and confirm that per-capita GDP best explains cross-country divergence. They estimate that developing countries will catch up with the adoption rates in developed countries by 2017, but that stark absolute differences will remain, and the convergence of adoption will take until 2057 (Andrés et al., 2010).

Yet, as Warschauer (2003) and Toyama (2015) point out, the developmental challenge does not lie in access to technology alone. Instead, it lies in the effective integration of technology into communities, institutions, and societies (i.e., what is crucial is not so much the physical availability of ICTs, but people’s ability to make use of those technologies to engage in meaningful social practices). The difficulty of using ICTs is especially evident in the BoP (Aoyama with Parthasarathy, 2016). First, affordability was a major reason why this segment of the population had difficulty in accessing ICTs. Second, the BoP is found in locations where complementary infrastructure, such as power, is typically weak to non-existent. Third, the BoP is not socioculturally homogenous, and it is characterized by relatively limited skills and low levels of literacy.

To address such challenges, MNEs seeking to boost their triple bottom line have been turning to frugal innovation, which Tiwari & Herstatt (2012) define as:

New or significantly improved products (both goods and services), processes, or marketing or organizational methods that seek to minimize the use of material and financial resources in the complete value chain (development, manufacturing, distribution, consumption, and disposal) with the objective of reducing the cost of ownership while fulfilling or even exceeding certain pre-defined criteria of acceptable quality standards. (p. 4)

As *The Economist* (2010) points out, frugal innovation is not merely about cutting costs; instead, frugal

10. It is informational as the productivity and competitiveness of its units depend on their capacity to “generate, process and apply efficient knowledge based information.” It is global as “its core activities of production, consumption and circulation are organized and generated on a global scale either directly or through a network of linkages between economic agents.” It is networked as “its productivity is generated through and competition is played out in a global network of interaction between business networks” (Castells, 2000, pp. 77–78).

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products must be robust and easy to use, they must use raw materials sparingly and they must pay attention to their environmental impact. Alas, achieving frugal innovation has been harder than providing a comprehensive definition.

The significant challenge for frugal innovation has been the lack of lead users, or those who “provide the stimuli for most global products and processes for a multinational company. Local innovations in such markets become useful elsewhere as the environmental characteristics that stimulated such innovations diffuse to other locations” (Bartlett & Ghosal, 1990, p. 243). Thus far, lead users have been usually sought in the Global North, where high per-capita incomes afford people the exposure to new technologies and innovations and allow them to evaluate alternatives in an environment with robust and reliable infrastructure (Bartlett & Ghosal, 1990; Gerybadze & Reger, 1999). Thus, innovating for the BoP is not well-understood by MNEs, despite their technological wherewithal.

Further, innovation is typically understood as a technology-driven process, and how demand-side knowledge is incorporated into the process of innovation and product development is undertheorized (Aoyama with Parthasarathy 2012). Although literature that highlights the importance of producer–user interactions (see, for instance, Lundvall, 1988) and user-led innovation (see, for instance, von Hippel, 2005) exists, it largely assumes that users are known and specified, which can hardly be claimed about frugal innovation. Even when there is a familiarity with users, geographers have emphasized the importance of what Polanyi (2009) termed tacit knowledge and the importance of “learning-by-interacting,” which comes only with physical presence in a place (Gertler, 2003). Thus, the critical role of lead users and the geography of innovation.

In addition to the importance of physical presence for accessing tacit knowledge, scholars like Chesbrough (2005) point to emerging models of “open innovation,” in which firms eschew an exclusive reliance on in-house research; instead, they have grown to rely on the cross-fertilization of ideas, which interaction with a range of partners can provide. More broadly, Cantwell, Dunning, & Lundan (2010) argue that MNEs find various ways to cope with the uncertainties that accompany changes in technologies and institutions. In particular, the authors note the greater autonomy given to subsidiaries to experiment and create nodes of competence by acquiring and recombining dispersed knowledge.

This article highlights how MNEs are reaching out to NGOs for ideas and knowledge to cope with the challenges of meeting the BoP’s needs. Although NGOs have been around for at least four centuries in their role as activists or advocates for various ideals (Spar & La Mure, 2003), they have become prominent in the past three decades as the third sector, with their role expanding to service provision in an attempt to overcome the inadequacies of state-led development efforts (Banks & Hulme, 2012). NGOs not only hold the state to account for developmental failures, they have also widened their target to the practices of firms. While the activist/advocate role often makes NGOs and firms view one another as adversaries, firms have been drawn to the service provider role of NGOs. As NGOs have cultivated grassroots linkages with the underprivileged to permit the design of services and programs, using approaches centered around community participation, these linkages are of particular interest to firms. In other words, as the reach of NGOs has grown with the increase in their number and size, they provide crucial “last-mile connectivity” to the lead users in local markets and offer spatially “sticky” tacit knowledge (Gertler, 2003) that global MNEs find hard to obtain on their own.

MNE–NGO Partnerships in India

There are, in theory, many locations that could provide MNEs with the opportunity to acquaint themselves with the BoP market. But India is sought after because it has a large socially and culturally diverse population, a large proportion of which lives in poverty and illiteracy amid an inadequate infrastructure.¹¹ Although such circumstances, plus an unpredictable regulatory environment and corruption in public life, can prove chaotic and challenge firms, the subtitle of Venkatesan’s (2013) book, *Conquering the Chaos*, proclaims “Win in India, Win Everywhere.”

11. According to UNDP (2015), India’s Human Development Index ranked 130 among 188 countries. The number of people earning less than US\$1.25 a day (purchasing power parity) was 23.6%, and only 62.8% of adults (15 years and older) were literate, compared to the world figure of 81.2%.

What makes “winning” in India more likely than anywhere else is the availability of technical skills to design and deploy ICTs to address the challenges of the BoP. It is the availability of skilled engineers that enabled India to take advantage of digitization and offshoring from the Global North to become the world’s largest exporter of software services (Parthasarathy, 2010).¹² Second, a thriving civil society in the world’s largest democracy has allowed NGOs to step in to make up, at least partially, for the state’s failure to provide an array of social and physical infrastructures (Jenkins, 2010). Thus, India has more NGOs than any other country—an estimated 1.2 million, approximately one for every 600 people, compared to one policeman for every 963 people.¹³

Third, since India’s 11th Five-Year Plan (2007–2012) was published, state policy has emphasized inclusive development to empower the poor (Government of India, 2008). The policy acknowledges that such development goals cannot be met by relying exclusively on the state. It thus calls for the involvement of many stakeholders, including the private sector, citizens’ groups, and the voluntary sector, to work with and improve the efficacy of government action. NGOs’ roles within the new framework of inclusive development began to change with several legislative initiatives,¹⁴ of which the passage of the National Rural Employment Guarantee Act (NREGA) in 2005 is prominent.¹⁵ Described as the “the largest and most ambitious social security and public works programme in the world,” the NREGA guarantees 100 days of unskilled manual work in a financial year to adult members in every household on projects that create durable assets such as flood control works. NGOs became active in the implementation of these projects and in the social audits that the act mandates to check corruption. Similarly, the National Rural Health Mission (NRHM), which was launched on April 12, 2005 to make the public health delivery system functional and accountable and to thereby provide accessible, affordable, quality health care to the rural population, declared that the involvement of NGOs was critical for NRHM’s success.¹⁶

NGOs were not merely sought to help implement the expanded social agenda of the state. They also gained access to additional resources with the passage of the Companies Act 2013.¹⁷ Section 135 of the act requires firms with a net profit of INR50 million¹⁸ or more during any financial year to spend, in every financial year, at least 2% of the average net profits of the three immediately preceding financial years toward achieving the goals of a publicly articulated corporate social responsibility (CSR) policy. Achieving the CSR policy goals requires firms to work in partnership with local authorities, business associations, and civil society/NGOs.

The need to work together to spend the additional resources, whether for public welfare programs or for CSR, is not the only factor altering the NGO–donor relationship. It is also a result of a growing tendency toward what DiMaggio & Powell (1983) term institutional isomorphism, as NGOs have come to adopt the processes and structures of MNEs. NGOs have had to streamline their previously ad-hoc operations to demonstrate their accountability to donors who insist on monitoring and evaluation. While large, well-funded NGOs have the internal means to meet external demands, most smaller NGOs find it difficult.¹⁹ To help these NGOs, new intermediaries have emerged to connect donors and funding recipients. For instance, an open

12. Despite relatively low literacy levels, post-independence India managed to train a large number of engineers. One indicator of skills availability is the annual output of graduates with a Bachelor’s degree in engineering. This output grew from 247 at the time of independence in 1947 to 237,000 in 2006 (Banerjee & Muley, 2010). The corresponding figure for the U.S. in 2006 was 104,200 (Banerjee & Muley, 2010).

13. <https://nonprofitquarterly.org/2015/05/04/why-have-9-000-indian-ngos-been-deregistered/>

14. Interview with the executive director of a Bangalore-based NGO, September 17, 2012, Bangalore.

15. The full text of the act is available at <http://nrega.nic.in/rajaswa.pdf>

16. For details of the NRHM see <http://nhm.gov.in/images/pdf/about-nrhm/nrhm-framework-implementation/nrhm-framework-latest.pdf>

17. For more details see <http://www.mca.gov.in/Ministry/pdf/CompaniesAct2013.pdf>. Schedule 7 of the act specifies the activities (e.g., eradicating poverty, improving health, promoting education) that may be included by firms in their CSR policies.

18. Approximately equivalent to US\$780,000 at current exchange rates.

19. The managing trustee of a Bangalore-based NGO, which helps MNEs meet their CSR goals, attributed this in an interview on July 3, 2012 to many NGOs being run by idealists from a social work background. But, he added, as more MNE employees moved to work with NGOs, it made for an easier relationship. He emphasized how his years of experience working with a large MNE and his connections in the corporate world helped him communicate and manage the expectations of the NGO’s funders.

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online platform of a Mumbai-based entrepreneurial initiative provides tools to manage, store, and analyze data that would otherwise be inaccessible to smaller NGOs.²⁰ Access to the platform is free to the extent that the NGO publicly shares its data. Such sharing allows other NGOs, working on similar issues in areas nearby, to avoid replicating data collection. While this was the platform's original purpose, it is increasingly used as a monitoring, evaluation, advertising, and decision-making tool, as NGOs create transparent structures to show donors how their money is being used and, in the process, attempt to attract further funding.

Case Studies

This section presents two case studies of MNE–NGO partnerships in India, where the state is also involved. These cases are drawn from a project on innovation for the BoP that the authors undertook.²¹ While the cases presented here draw directly on four interviews, they are also informed indirectly by the 115 semistructured interviews carried out with stakeholders and their partners in India between 2011 and 2014. Stakeholders ranged from business units and CSR sections of MNEs, social enterprises, private foundations, and global and grassroots NGOs. Our research is qualitative, and the sample size does not allow us to demonstrate representativeness; rather, the two cases are, in our opinion, paradigmatic and offer insights into the partnerships emerging in the deployment of ICTs for development.

Rural Livelihoods and Health

A powerful brake on the livelihood strategies of poor and socially marginalized farmers are weak ties to producer and market institutions.²² Working with small dry land farmers in the state of Karnataka, a Bangalore-based NGO realized that while two thirds were growing *toor dal* (a type of lentils), the farmers typically got only INR30 (per kilogram) for their dal, whereas it was being sold in the main town for INR80.²³ The price differential showed how beholden the farmers were to moneylenders and middlemen for credit and other farm inputs such as seeds. High interest rates on loans left the farmers indebted.

The NGO became involved in finding better market prices for the farmers. To that end, it helped the small farmers organize and negotiate directly with the market and get more for their produce. Thus, the NGO partnered with the National Commodity Exchange (NCX) in Mumbai, which provided an electronic transaction platform and directly accessible information about prevailing market rates over mobile phones. Working with the state's Department of Agriculture, a toor board was established so farmers could aggregate, sort, and clean their produce and have it assessed by the NCX. This also facilitated payments to farmers by banks.

A U.S. MNE helped create and maintain the platform as part of its CSR initiative. The MNE sent two employees to spend four weeks examining the toor dal trade, including aspects such as value addition to toor and the benefits of using a spot exchange, which helped pull aspects of the toor dal farming from “the 19th to the 21st century straight away.” There were two aspects of the partnership highlighted by the NGO. First, the MNE did not simply give money; it also sent its employees. Second, these employees came not to oversee spending, but to connect production with markets in a way that had occurred neither to the NGO nor to the farmers.

The NGO is working with the same MNE in the health domain in a poor region of Karnataka, where a high proportion of pregnant women, adolescent girls, and children below the age of five suffer from anemia. The MNE is developing software to capture the data of individual patients, with their geographical location, their photograph, their status before and after treatment, and further steps to be taken. The information is captured in real time and loaded onto a platform already created under the NRHM. With the ubiquity of mobile phones, the software sends periodic reminders to patients to obtain their treatment doses from the local

20. Interview with the founder and technical lead, July 24, 2012, Bangalore.

21. The project was called “The Global Shift in R&D Alliances: Multinational Enterprises (MNEs) and the Quest for the ‘Base of the Pyramid’ (BoP) Markets” and supported by a U.S. National Science Foundation grant (BCS-1127329), for which the authors were the principal investigators.

22. The experience of this NGO is drawn primarily from an interview with its executive director, September 17, 2012, supplemented with data from its website.

23. INR30 and INR80 are approximately equivalent to US\$0.47 and US\$1.25 respectively at current exchange rates.

primary health center. This NGO–MNE–state collaboration led to a 90% reduction in the region’s incidence of anemia.

The relationship with the NGO reflects the broad-based interaction that the MNE has through its CSR programs.²⁴ This specific partnership with the NGO is part of a program established in 2008 to send employees to work with government, business and civic leaders, and NGOs to create a cadre of global leaders with an understanding of social issues in the Global South. Employees chosen for the program are sent to work on projects for a month in teams of three to four. Since any employee who has worked for at least two years with the MNE and has met certain performance criteria is eligible to apply, the teams are diverse in terms of nationality and functional capability. During the period on the project, the employees are freed from their regular responsibilities at the MNE. Since the program launched in 2008, it has deployed more than 24,000 employees from 50 countries to 30 countries of the Global South.

Education

For a U.S. MNE that had been in India since 1995 to take advantage of low-cost engineering talent, a “globalization vision” launched in 2006 witnessed the establishment of a Globalization Center East in the country. It replicates headquarters’ functions, including R&D, sales, and customer support, but is primarily geared to address new customers in the Global South.²⁵ With the new vision, the focus shifted to “country transformation” and R&D for “inclusive growth,” with an emphasis on areas such as health care, transportation, infrastructure, safety and security, and energy, where the MNE’s technologies could play an enabling and potentially transformative role in the Global South. This had two implications for the MNE, which defines itself primarily as a product company that serves global enterprises. First, it had to make a greater effort to bundle products with content and services in a form that would directly serve end users who lacked familiarity with technology. Second, to ensure acceptance of those bundles, the MNE needed partnerships with NGOs to demonstrate proofs-of-concept that could feed back into R&D for inclusive growth. It also needed partnerships with governments to scale across large swathes of the country and lower the average cost of technology deployment and use.

The MNE began to work with an NGO that had worked with government schools and, since 2006, was creating digital content in English, mathematics, and science in the regional language, conforming to state educational standards.²⁶ In 2009, after the MNE had donated US\$10 million to flood relief in Karnataka and helped rebuild four village schools using its conferencing system for tele-education, the NGO entered into a partnership to launch a pilot program for online teaching, evaluation, and monitoring. The classroom requirement of the system is a desktop or laptop computer with Internet connection, an IP camera, and the capability to project images so that a teacher can simultaneously teach multiple classrooms from one location. With the integration of smart whiteboards and the possibility for two-way communication, teaching is conducted in broadcast mode. This integrated system also allows students to interact with the teacher in real time, while allowing the teacher to interact with several classes at once. In essence the system creates a large virtual classroom. While the platform meets international industry standards, it is also designed to work on a 2-mbps line, to be frugal in its power consumption, and to handle fluctuating power supply. In addition to the real-time online platform, the NGO also drew on partnerships with other corporate entities and NGOs for infrastructure and solar energy solutions to reach out to 250,000 students in Karnataka by 2014.

The Changing MNE–NGO Relationship

The cases show how MNEs and NGOs have come to work with one another, especially to address the needs of the BoP populations, with MNEs acknowledging their lack of contextual familiarity despite their technological expertise and financial might. Thus, in the second case, although the MNE is a global leader in networking products, it realized that it could not merely localize a product meant for other global enterprises if it wanted

24. This MNE’s experience is drawn primarily from an interview with its manager of corporate citizenship and corporate affairs, July 26, 2012, supplemented with data from the firm’s website.

25. Information about the MNE’s experience is drawn primarily from an interview with its president of inclusive growth, July 2, 2012, Bangalore, supplemented with data from the firm’s website.

26. Information about the NGO’s experience is drawn primarily from an interview with its founder and managing trustee, July 18, 2012, Bangalore, supplemented with data from the NGO’s website.

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to pursue its goal of inclusive innovation. Instead, it would have to offer its product in a new form, with relevant content and services before it could directly serve school teachers in the domain of education. It is to learn how to create relevant educational content and services and how to bundle them with its technology for rural government schools, potentially the largest market in the domain, that the MNE went into partnership with the NGO. While acknowledging that the MNE envisioned the pilot as a means of launching a business with public education systems in India and elsewhere, for the NGO, too, this was an opportunity that gave it the infrastructure to affordably deliver content and to share the best practices of qualified urban teachers with schools plagued by teacher shortages.

In the rural livelihoods example, the NGO was able to benefit from the MNE's help in building a platform to aggregate, sort, and sell produce on the National Commodity Exchange. This effort transformed ideas about trading for the farmers and the NGO. Similarly, the development of software that captured information about pregnant women and children significantly reduced cases of anemia. Here, immediate commercial benefit was not critical to the MNE. Instead, what was critical was access to the NGO's networks that could provide exposure to rich real-world problems. Indeed, the goal of the international exchange program was to sensitize employees, the potential leaders of tomorrow, to the problems of the Global South. It also suggests that the flow of ideas is no longer unidirectional (i.e., from the Global North to the Global South). The growing relevance and value of such flows is evident when Govindarajan and Trimble (2012) exhort MNEs to indulge in reverse innovation by learning from the BoP in the Global South.

Although there are an increasing number of partnerships between previously antagonistic players, there is still evidence of unease between them. For MNEs, the perception is still that NGOs are primarily seeking money and show little appreciation of anything else offered to them. Thus, the MNE in the rural livelihoods case mentioned that rather than write checks, it preferred to work with an NGO for whom the technology and talent at its disposal could make a difference. Indeed, in 2012 the MNE began to offer grants in India with which NGOs could access the MNE's technology and consultants for strategy assessment, project management, digital marketing, and creation of a technology roadmap. The MNE in the education case study was equally emphatic in saying that most NGOs were only good for establishing proofs-of-concept because their imagination and operations tended to be very local.

For their part, NGOs find it hard to negotiate the corporate organizational maze and to communicate with MNEs that, despite being ignorant of the challenges on the ground, typically expect "targets" to be met within a timeframe.²⁷ As the NGO staff in the rural livelihoods project mentioned, they must be wary of MNEs that view development work as a business proposition to push their products. This fosters a patronizing relationship between funder and recipient, rather than encouraging them to work together on issues of mutual interest.

Conclusions

Rather than continue to ask which projects or ICT deployments in various developmental domains work or the conditions in which they can be expected to deliver what they promise, this article posed the question: *Why do deployments take the form they do?* In other words, instead of assessing whether or not ICT deployments subvert the "end of history," this article asks how changing conceptions of development have shaped ICT deployments. To answer this question, the article argues that the deployment of microelectronics-based ICTs cannot be understood without appreciating the shift in the conception of development from capitalist economic growth to eradicating poverty.

The shift in the conception of development coincides with the ICT-driven third industrial revolution and globalization enabled, in part, by ICTs. However, while ICTs are increasingly affordable general-purpose technologies offering application in a variety of domains, the informational economy is also characterized by uneven geographies of accumulation and it challenges simplistic notions of technological trickle-down. In an acknowledgment of persistent inequities, there is growing emphasis, as evident in the MDGs and SDGs, of

27. Interview with the managing trustee of a Bangalore-based NGO, July 3, 2012, Bangalore.

the need for partnerships among the public sector, the private sector, and civil society organizations to eradicate poverty.

In the efforts to eradicate poverty, the BoP population has received special attention. But catering to the poorest segments of the world's population, with relatively high levels of illiteracy and living amid inadequate physical infrastructure, is not easy. It is hard even for MNEs, with their extensive financial and technological resources, as they move from focusing on the single bottom line to a triple bottom line. The challenge of the BoP has led to discussions about new approaches to innovation, especially frugal innovation. But a new approach to innovation also demands new organizational means to gain familiarity with user needs, especially hitherto-ignored users with little prior exposure to technology. As the need for access to a new category of lead users becomes imperative and understanding users has a significantly sticky, tacit component, MNEs find it hard to innovate without insights from external partners who have an intimate understanding of the locality. Thus, they have reached out to NGOs in the Global South. Yet, it is not merely MNEs reaching out to NGOs. Thus far, NGOs primarily took on activist and advocacy roles, challenging and holding MNEs and the state accountable. But even as MNEs reach out to NGOs as partners, NGOs also seek MNEs for critical resources, including technologies and funds, which they need to assist their target communities. One consequence has been increasing institutional isomorphism as NGOs adopt the practices of MNEs.

India has become an attractive location for frugal innovation and for creating new partnerships to deploy ICTs for development. India is sought after because it has a large poor and illiterate population living amid great sociocultural diversity and shabby infrastructure. Although these circumstances go hand in hand with an unpredictable regulatory environment and public corruption, what makes India a draw is also its pool of skilled labor whose capabilities have been in evidence as the country has become the largest exporter of software services. Further, the state's failure to provide reliable services to much of its citizenry has made the country a fertile ground for NGOs. Lately, acknowledging its failures, the state has pushed for inclusive development. But, in keeping with shifting discourses on development, the state has not only reached out to partners, but has also provided a legislative framework with the incentives to nudge them to work together. As a result, MNEs and NGOs use India as a location from which to understand and perhaps solve problems of the BoP in domains such as health, education, and livelihoods. This illustrates how partnerships are coming to play a role in the deployment of ICTs for development to eliminate poverty as well as ensure that ideas no longer flow unilaterally from the Global North to the Global South. ■

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