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Introduction

How do you popularize an infrastructure? The question may seem strange. Infrastructure, and especially digital infrastructure, can seem an unalloyed good—that which enables others' productive activities. Development projects often present places as in need of infrastructure—power lines, phone lines, computers, or Internet networks. Infrastructures promise circulation and mobility. They promise the transformation of ideas, the movement of bodies, and the possibility of progress (Larkin 2013). But what if infrastructure exists but people have not taken it up? This has been the case in many parts of the world with the networks of computers, protocols, and fiber optic cable we call the Internet. For the last three decades, the Internet has marked the edge of modernity for many policymakers and users (Burrell and Anderson 2008). To policymakers and economists, the Internet was a "general purpose" technology (Brynjolfsson and McAfee 2014); they cast it as more than a tool—a technology that enables a wide range of innovations. Others read it as inherently democratic (Chan 2013). This, as Friederici argues earlier in this volume, is the "hope and hype" of the Internet.

Despite this "hope and hype," policymakers have faced a largely unused Internet in many parts of the "developing" world. A 2011 report by the World Bank's Independent Evaluation Group (IEG) looked back on almost a decade of information technology investment and found contradictory results. Where people had Internet access, they still often did not use it (IEG 2011, 11; Best and Kenny 2009). This contrasted with mobile usage (Best and Kenny 2009) and mobile penetration, which grew from 10 percent in 2005 to 85 percent in 2009 (IEG 2011, xiii). The IEG recommended that

the World Bank encourage the development of IT applications that would "capitalize" on the extensive investment in Internet infrastructure already made. The Internet was supposed to be a global technology. But its globality seems late in arriving.

For those heavily invested in the Internet—financially, materially, or ideologically—the problem has been how to fulfill its promise. The core question of this article becomes, then, how do powerful institutions and firms popularize an infrastructure in which they have already invested? Hackathons offer one powerful technique. The hackathon is a short event—often lasting a day or two—where organizers invite people to imagine and prototype software applications. The format provides people an opening to tinker, play, network, and create prototype technologies, often for organizations other than those that employ them. With hackathons, organizations open up technical production to more public participation. The World Bank, for example, has organized a water hackathon to attract entrepreneurial coders to create apps that make the Internet more useful than it has been (World Bank 2012b). Crowdsourcing companies hold hackathons to popularize the idea of the data-processing gig economy. The Gates Foundation, Facebook, and the US State Department hold hackathons to enlist people all over the world to rapidly build new applications using sanctioned infrastructures and, implicitly, to address conveners' problems. These powerful hackathon conveners invite programmers to solve problems in ways that valorize conveners' infrastructures, co-opting hope and labor in one hacked experiment after another (Zukin and Papadantonakis 2018).

In this chapter I examine what happens when organizations ask people to imagine the Internet and its platforms as answers to social needs, including a look at the limits of prototyping apps in short time frames as a way of addressing those needs. My analysis focuses on three cases of hackathons, which I approach both ethnographically and historically. Two cases are drawn from an ethnographic study of development practices spanning South Asia and Silicon Valley. The third is from an examination of primary World Bank documents that report on the challenges of ICT policy and interventions at the bank—challenges to which hackathons appeared as one best practice solution. From the vantage point of these three case studies, I argue that hackathons invite participants to innovate, but on a set of platforms and infrastructures that, while enabling fast prototyping, also heavily delimit the range of technologies the event can produce. In

some cases, the infrastructural investments of hackathons are the material background conditions that enable the event but that escape the notice of participants. In many cases, however, organizations convene hackathons precisely to mine participants' activities for "legitimate futures" that extend the organizations' digital reach and use.

What Are Hackathons?

Through hackathons, entrepreneurial producers experiment with how to make something useful out of existing bodies of digital code and infrastructures. These intense software production events have instantiated a cultural form that originally developed in open source production communities. Hackathons began as a way for participants in globally distributed open source projects—those already invested in an infrastructure—to work together, face-to-face, for a short time. Face-to-face, programmers who normally only connect online can quickly locate and fix bugs in project code by pointing, talking, and guiding attention and collaboration with their whole bodies. These hackathons have allowed for intense collaboration among programmers with pre-existing deep ties to the open source community (Coleman 2013, 209).

While the early, open source hackathons often focused on improving, repairing, and maintaining shared infrastructures, hackathons have grown to include speculation about technological futures. Facebook regularly hosts both internal and public hackathons to explore future projects and to inculcate in employees the ethos to "move fast and break things" (Fattal 2012, 940). Institutions as large as the United Nations or as small as a coworkspace might put on hackathons to brainstorm about organizational problems, energizing volunteers to generate large numbers of approaches to the issue at hand. Such hackathons might generate ideas for social ventures, tools for mapping water in crisis regions, or prototypes of future startup offerings. These events often fail to produce actual working technologies (Lodato and DiSalvo 2016), but they are more than just a way of exploring possible futures—hackathons can also become rehearsals for future employment, partnerships, or investments. The events often end with participants showing off their work to venture capitalists, philanthropists, or recruiters—those with the power to invest money, time, and connections in the software futures on display.

In recent years, companies, NGOs, universities, and even government agencies have taken up hackathons as a means to recruit volunteer labor, generate interest in social or technological platforms, and develop new partnerships. In 2012, Infosys partnered with the World Bank as part of a global sanitation hackathon (Infosys 2012), and in 2013, nonprofits and government bodies across the United States participated in a National Civic Day of Hacking, an intense Saturday of coordinated digital volunteerism (Knell 2013). Independently, the Gates Foundation and Facebook organized HackEd, a hackathon to turn massive data sets (and the background specter of surveillance) into the promise of education apps (O'Dell 2013). More recently, the Government of India has offered up education data sets at an OpenEducation AI hackathon sponsored by IBM, Amazon Web Services, Google, and Indian education startups (OpenEd.ai 2017). Hackathons proliferate as a space that allows firms to explore hires, investment, and ideas that might not otherwise readily emerge within the culture of the organization. Crucially, conveners promote their own and partners' infrastructures as the bases for this exploratory labor.

Tapping Labor, Expertise, Relationships, and Political Hope

In this section, I explore the uses to which organizations put hackathons as a widely deployed organizational form. Broadly, I argue that we can examine hackathons as sites that allow conveners to access labor, affective knowledge, and relationships.

First, labor. Most simply, hackathons invite participants to provide free experimental labor. Cultural scholar Melissa Gregg argues that civic hackathons invite citizens to donate labor to governments starved by austerity measures (2015). With Gregg, I argue here that hackathons solicit donated labor, specifically research and development labor. But even where austerity does not hold—such as in profitable corporations and design firms—organizations seek donated labor to tap the resources of those outside their bounds. Hackathons are not only austerity measures.

Second, hackathons invite participants to develop their own projects, resources, and desires in response to the convener's agendas and provocations. The events become a kind of postmodern software laboratory. As shown in critiques of top-down software design and top-down development initiatives alike, development institutions and companies employ a range

of techniques to characterize market preferences, symbolic meanings, and practices. Hackathons invite participants to generate varied experiments in meaningful technology. With hackathons, conveners tap participants' varied imaginations and tacit knowledge to point the hosting organization in novel directions.

Third, hackathons allow conveners to explore potential relationships with participants without commitment (Jones, Semel, and Le 2015). The events enable convening organizations to explore potential relationships through concrete joint activity that might reveal something of the viability of the partnership in the longer term. In this sense, hackathons masquerade as participation but might more accurately function as interview and evaluation spaces. This becomes particularly crucial when international development projects rely on partnerships and networks among NGO, firm, and state actors.

Fourth, hackathons tap political hope and redirect it into exploratory research and development. Several scholars of hackathons have pointed to histories of issue-based activism that make hackathons meaningful for participants (Lodato and DiSalvo 2016; Schrock 2016). Hackathons also appear as one response to critiques of development as a form of universalizing top-down expertise (Elyachar 2012, 117). In place of experts sent by foreign countries and agencies, hackathons invite citizens to act as innovators of their own lives, as well as those of their neighbors. They channel people's own frustrations with development into donated research and development labor. Elsewhere, I argue that hackathons are a mechanism to train citizens to become entrepreneurial agents of development, with potentially antidemocratic consequences (Irani 2015b).
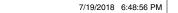
With hackathons, then, conveners tap local labor, cultural knowledge, relationships, and hope to search for what value can be made from their existing infrastructural investments.

Searching for Value at the Margins of Platforms

The three hackathons that form the focus of this chapter took place in 2011. What connects them is the Internet, its platforms, and digital toolkits as promising infrastructures. The first case is a hackathon organized by a design studio in Delhi, which demonstrates how hackathons translate expansive political hope into more limited projects that extend the value

of already existing infrastructures. In the second case, the World Bank coordinated a set of simultaneous water hackathons in cities around the world. Like the Delhi hackathon, the World Bank events drew participants with diverse hopes and relationships nearer to the bank and its partners. The bank case demonstrates how organizations can use hackathons to locate partners already amenable to pre-existing agendas. I conclude with the case of a hackathon organized by a nascent crowdsourcing startup in Silicon Valley. This case makes clear that hackathons do more than extend the value of existing infrastructures; they can also legitimize infrastructures whose validity is in question.

OpenGovernment in Delhi: Hitting the Limits of Extant Infrastructure

A Delhi "innovation and strategy" studio, DevDesign, served as translator for the first hackathon, searching the lives of the marginalized for their needs and desires. Though DevDesign staff members were usually employed as ethnographers for hire, they also spun off their own initiatives to find opportunities for projects to pitch to funders. The hackathon was one such initiative, organized to generate possible futures. At other times, the staff would casually brainstorm, develop hypothetical project proposals, or even pursue side projects at work. Studio members could later winnow these proliferating projects to those worth pursuing at any given time.

Vipin, a senior consultant at DevDesign, organized this hackathon around the theme of open governance. Vipin was a former Accenture management consultant who had long dreamt of ways to engineer improvements in society. He consulted with the Gates Foundation. He lunched with Ford Foundation officers. As a graduate of the Indian Institute of Technology (IIT) and Indian Institute of Management (IIM), both government-funded schools, Vipin was a product of long-term state investments in technical and organizational education. He carried PDF slide decks on his laptop, ready to show training programs and digital platforms to potential funders and partners as he moved through Delhi's development worlds. Vipin was the grandson of an Indian Administrative Service officer, carrying on a family occupation in its postliberalization form—the public-private partnership.

With the hackathon, he solicited applications through his professional and personal networks, as well as via email lists for development workers, like Idealist.org. Out of about thirty applicants, he chose three software engineers from Delhi and Hyderabad, an Ivy League political anthropologist

based in Delhi, an American designer working between Nairobi and London, and me. I had worked at the DevDesign studio for ten months at that point. We would all work together for five days.

British Council sponsorship funded travel for the American living in London. The studio poured some of its own resources into funding accommodations for hackathon participants. The hackathon was just one of several workshops at a Delhi festival celebrating and teaching activism, entrepreneurialism, and development to students and professionals. Other workshops included designing craft programs for an ashram NGO in Ahmedabad and developing solar power initiatives in Auroville, a UNESCO-recognized experimental community in Tamil Nadu. The workshops all brought together people who did not know each other to spend a few days dreaming up development projects and then making those dreams concrete, as demos, plans, and presentations. They were sites of experimental production. The hackathon was just the digital version of these promissory sites of experiment.

The festival and the hackathon within it were funded by the DevDesign studio and by several European cultural institutions. The studio invested in the festival as a way of building a "scene" of like-minded people interested in development, nonprofit work, and cultural experiments in film-making, literature, and innovation. Through a scene, the studio would be able to find potential clients, potential contractors (animators, artists, and translators, for example), and potential funders, whether for-profit or non-profit. The scene brought together a set of people, resources, and sensibilities around forms of life, entertainment, and reason. The Delhi festival as a whole also offered an audience for European cultural institutions and their soft diplomacy efforts to build up "creative economies" by finding Indian business partners for Switzerland, France, Germany, and the UK. For DevDesign members, these European institutions offered connections to "global" perspectives and links to networks with resources and potential clients. Attendees paid 1,000 rupees, or US$20, to connect to the scene, to learn of others' work, and to sustain their hope amid entrepreneurial precarity and the apparent high failure rate of development projects.

Many of these motivations were at play for those of us at the hackathon. As we ambled into the studio at nine o'clock the first morning, the cook handed us chai, and we sat with laptops open at a long table. The convener had us introduce ourselves and share our motivations for attending. Many

of us spoke to the seduction of tangible action—of making and doing something that goes beyond mere description, or complaint. A young software consultant from Bangalore wanted to quit "cribbing" about governmental inefficacy to "see if we can make a difference." An IIT-trained designer, he wanted to see if design could actually "save the world" instead of just "making posters" for clients about doing so. The convener (Vipin), a startup founder, wanted to help citizens "like him" direct their energy into "good governance." I was there to see what would happen if I brought together my anthropological sensibilities, which are critical of development, and my coding skills to attempt technology as a critical practice—I came to the hackathon with genuine hope. Prem, a legal anthropologist, came because, in his words, "anthropologists sit and critique things but they never get around to doing anything." All the speech act theory in the world left him still wanting to experiment with other forms of intervention.

The hackathon was a device for translating these various desires, backgrounds, and political sensibilities into experimental labor and promising demos. Three of us were consultants in various capacities who hoped to sustain our demo through some indeterminate form of financial support: maybe a startup, a grant proposal, or a state contract.

Each of us brought different forms of expertise. Three of us had worked as professional software designers. Three were working software engineers. Prem, the anthropologist, came to the table with two years of research with land rights movements, both in remote Uttar Pradesh and among Delhi activists. His accounts of political struggle grounded our collaborative imagining (Murphy 2005) of what a social media system might do, in what form, and for whom.

We each also drew on different networks of resources and social ties. I set up a meeting with a consultant to the Government of India Planning Commission. We peppered him with questions to explore how we might locate a partner within the government. To explain the law-making process to us, Vipin brought in a friend whose NGO worked with the Indian Parliament. He suggested that his NGO might be interested in finding funders to carry forward what we prototyped in those five days. Vipin later told us he also knew program officers at the Ford Foundation who were "looking for inspiration from a good project"—he promised these social connections to diversify his portfolio of potential investors in the future of whatever software we would produce.

Crucially, we also came to the table with varied visions of politics. Vipin was, in the end, a technocrat. He described the law as codes—encodings of incentive and punishment. He wanted to "open government" by allowing citizen-experts—lawyers, consultants, and other highly trained citizens—to find the loopholes, bugs, and design flaws in the law. He was interested in governing, not politics. Another software engineer, Ravi, mostly tinkered quietly on his computer. Occasionally, he raised his head to ask when we would be done deliberating so we could schedule deadlines to engineer the prototype by the end of the hackathon. Others, however, leaned toward a messier sense of politics as struggle. Prem, an avowed Marxist, studied people's struggles to win and gain rights to land from the state, despite face-offs with police, mining companies, and henchmen. Prem, and many of us with him, did not share Vipin's faith in elite experts as a substitute for the politics of the poor. Dinesh, a programmer with a penchant for painting and feminist science studies, told tales of his bicycle tours of rural Maharashtra, arguing for the technological and political savvy of the villagers he met along the way.

Our challenge was to converge on a project recognizable as open governance—the theme of the hackathon—that each volunteer would be willing to labor toward. Prem and Vipin staked out opposing positions. The process of debate, however, brought to the surface different accounts of reality, different theories of politics, and different imaginations of what *could* be possible. Out of our conflictual assembly of competing epistemologies—the technocrat and the Marxist, for example—we found a concept that most of us were excited to pursue. In Vipin's absence, the rest of us decided to work on a platform that tracked Indian parliamentary debates on bills. The platform would enable highly literate activists to track issues affecting movements they were involved in and allow organizers to document the face-to-face deliberations of poorer constituencies around central government issues.

These intense debates are central to how hackathons generate innovation. Sociologist David Stark characterizes innovation as the process of the search for opportunities amid multiple possible orders of worth (Stark 2009, xvii–xviii). The sorts of tensions we marked and managed are common features of such gatherings. The challenge was to make sure that arguments about facts did not get in the way of arguments about what could come to be. DevDesign actually benefited from the differences of opinion among

us; out of those conflicts, we identified risks to the projects and ways of recognizing potential value in a complex world.

The hackathon seemed to accommodate a more leftist politics, but the manufactured urgency and discipline of the demo pressed these politics in service of entrepreneurial insights. The activist support software, Prem warned us, would require "some REAL footwork" to get "on the street" and work with existing organizations that were thinking in terms of political participation. That week, we weren't on the street. We were in the studio. The hackathon afforded us little time to reach out to NGOs or activist networks. We had little time to understand their information practices or to build trust with them. We could not even promise maintenance of any demo to come out of a potential collaboration. Our work in the hackathon could only draw on the knowledge, desires, and relationships we brought into the room with us. Out of such materials and existing alliances, we were to fashion promising opportunities for philanthropists, investors, and volunteers. The time, tools, and skills in the room were geared toward prototype work, not footwork.

Even the kinds of prototype work we could undertake were limited by the political economies of Internet production in a country where few have direct access to the Internet. When we learned that only 10 percent of Indians have Internet access, we thought about alternative ICT infrastructures—phones or radios, for example. Krish, a software engineer, explained to us that in the long term, the project could get into rural areas through interactive voice response phone systems, rural kiosks, or SMS-based systems. "In Andhra Pradesh, there's a women's radio station," he told us. "The scope of what we want to envision is THAT. What we implement in five days is probably a website." The skills in the room were of the web; web tools were those most at hand for urgent hacking. He continued, "So we're going to go to a conversation where we'll chop off everything. Cut. Cut. Cut. Cut. But if there's a master document that accompanies this chopped up little thing …" he trailed off. The hackathon was an experiment in making prototypes of promising projects, constructing "opportunities" by drawing on bonds and resources already in hand. In the momentum of the hackathon, we had to build on existing infrastructural orders; there was little time to critique let alone challenge the power relations produced by the elite infrastructures on which the hackathon depended.

The World Bank "Water Hackathons": Searching for the Value of Infrastructural Investments

Like the DevDesign, the World Bank also wanted to generate new ideas, networks, and knowledge for projects. They accomplished this by organizing a global hackathon held simultaneously in ten cities in 2011.

A 2011 IEG report that looked back on almost a decade of information technology investment found contradictory results. On the one hand, the report found that mobile penetration grew globally from 10 percent in 2005 to 85 percent in 2009 (IEG 2011, xiii). On the other hand, Internet access had largely not reached the poor (11–13). Where people actually had Internet access, they often didn't use it (11).

The applications that could turn all that connective infrastructure into something useful have proven difficult to produce and manage. The bank has found it challenging to shift gears from large-scale government and corporate infrastructure projects to smaller ICT applications that need to fit into and gain buy-in from myriad users in diverse contexts to work (e.g., IEG 2011, xvi). Further, the bank lacked enough of its own IT experts who could support projects as need arose.

The World Bank's ICT group, one of the subjects of the evaluation, responded with a 2012–2015 strategy that explained how the group would address these issues. It stated that the bank needed to cultivate pools of external experts, "stimulate private sector and civil society development of applications," and focus on "service delivery"—an area of ICT investment where bank managers could offer the sorts of expertise and connections that venture capitalists, other banks, and most private investors could not. The ICT group also needed a strategy that would enable it to collaborate with other sectors of the bank. ICTs, the report noted, affect services across sectors—water, education, e-governance, employment—but IT staff, however few, were contained in one group.

The ICT group seized on the hackathon as a means to respond to these challenges and generate promising loan targets (see Weaver 2008, 735) across the private sector and civil society. In its 2012 strategy, the ICT group described hackathons as a way to "co-create services and applications with citizens and businesses" (World Bank 2012a, 7). The strategy described hackathons and app contests as ways to mobilize citizens and technologists as "a pool of creativity" to close a "service delivery gap" that many governments did not even know existed (7). These events called on

citizens to translate their tacit knowledge and frustrations into investable applications. These applications, the bank hoped, would make good on the promise of all the ICT and broadband infrastructure that other World Bank projects had funded.

In October 2011, the group convened a global hackathon in ten cities, including Nairobi, Bangalore, Cairo, Tel Aviv, and Washington, DC (World Bank 2012b, 55). The organizers subsequently published a report, *Water Hackathon: Lessons Learned*, as a World Bank Research Paper, explaining how the hackathon could become a model approach to development. With the hackathon, the organizers sought to raise "awareness of water sector challenges … among technical communities in-country and globally" (vi). In addition to awareness, the report continued, the organizers sought to create "a network of atypical partners engaged in finding solutions to water-related challenges," a "preparation of a list of challenges facing the water sector," and "adoption of new applications" in World Bank projects. The hackathon white paper describes the role of these partners as not only working on "locally identified problems" but also supporting "local community building by leveraging existing networks and recognized local champions" (5). The events, then, allowed the bank to bring existing, local, trusted, and productive relationships into its orbit to generate investable futures. The hackathon was thus a way for the bank to create a map of challenges, opportunities, coders, and relationships that could make the Internet matter locally.

These zones of experiment allowed representatives of private sector and "expert" organizations to discipline the dreams of hackathon participants. The city hackathons invited sponsors to offer problem statements as well as prizes. In Cairo, Pepsi offered cash prizes, while the agribusiness Farm Frites, Egypt's largest potato grower (World Bank 2012b, 29), posed irrigation problems that programmers might tackle. In Bangalore, Hewlett Packard, government ministries, and Pepsi were among the local partners (54). In Lagos, organizers consulted water experts and decided to focus on gray water recycling and borehole sharing. Judges from Google and Nokia guided and ultimately judged participants' projects.

The hackathons offered a way for the bank to search for futures. The futures were not just bits of software, or even demonstrations of software. They were demonstrations of particular assemblages, or comings together, of people and skills, passions, and relationships.

CrowdHack: Legitimizing Crowdsourcing Infrastructures

In Silicon Valley, another hackathon attempted to make crowdsourcing infrastructures relevant to engineers and the public. The startup Cloud-Factory organized a two-day hackathon in 2011 around the question of what can be done with a programmable workforce—a way of organizing the labor process referred to as "crowdsourcing" or "human computation" in high tech industries. CloudFactory, a human computation company, staged the event as a competition held before an industry and academic conference called CrowdConf.

CrowdConf convened engineers, academics, investors, journalists, and managers in imaginative and discursive work with financial implications. The conference, and the hackathon held as part of it, was a place to both explore and hype the value of crowdsourcing. Crowdsourcing as a high tech sector was still in formation in 2010. It refers to various ways of producing value out of networked digital labor. Journalist Jeff Howe coined the term in 2006 to describe Web 2.0 companies that solicited work from people through their computers and phones. "Human computation" services allowed programmers to outsource large volumes of data-processing work on demand and pay-as-you-go. Moreover, coders could outsource the work by algorithm, incorporating human work output directly into their code. CrowdConf, convened four times between 2010 and 2013, assembled those curious about and heavily invested in the "past, present, and future of crowdsourcing" (CrowdConf 2010, n.p.). The events, the press releases, the talks, and the hackathon all generated substance and created significance for crowdsourcing as something more than just a fancy name for outsourcing. CloudFactory and its competitors, like CrowdFlower and Amazon Mechanical Turk, collaborated in staging these events to build up public legitimacy and to engineer interest and investor taste for the sector.

One thing the crowdsourcing industry has had to fight is the perception that it is just another way to outsource anxious Americans' jobs. And there certainly are continuities with outsourcing; one CrowdConf speaker had spent years at McKinsey advising corporations how to outsource their work to India. At the conference, he outlined the gaps in outsourcing that more fragmented, contractual, and unpaid crowdsourcing workforces could fill.

CloudFactory, the hackathon host, stressed the ethical dimensions of its business model. During one of the conference sessions, the founders of CloudFactory described the company's origin in their travel from the United States to Nepal, where they "discovered an amazingly talented group of people" living in villages but making very little money (Sears 2017, n.p.). The CloudFactory founders built the company around enabling programmers to build automated processes that call on those talented Nepalis to do work. Their story echoed that of Samasource, an outsourcing company that promises to create jobs, rather than aid, for women, refugees, and youth living in poverty (Lehdonvirta and Ernkvist 2011). The CEO cited her first job managing an Indian call center as her inspiration to place call centers directly in slums (Abate 2014).

Crowdsourcing advocates emphasized the new kinds of technologies crowdsourcing made possible. "A lot of people don't get it," Karl, the CEO of an ethical crowdsourcing company, griped to me. "They're just trying to do outsourcing cheaper," he explained. He went on to explain how his company paid workers decent wages in India and hoped to make new kinds of programming possible. His goal, he explained, was to "create something with real value—apps that benefit everyone." His optimism was common among those at the conference who saw their love of technology as an interest in human well-being. Yet, this vision of "everyone" elided questions of which people labored and who reaped the benefits (Irani 2015a; see also Vora 2015).

Karl had attended CloudFactory's hackathon to explore just what "human computation," as a platform for programmers, could make possible for humanity. The rewards were few. In invitations to the event, organizers promised, "All hackers get caffeine (loads of it), pizza, glory (of course), and a limited edition CloudFactory t-shirt" (Allick 2011). They offered winners an "on-stage shout out" at the single-track conference and the chance to demonstrate their app in the exhibit hall. The hackathon began with workshops to teach participants how to use the platforms of choice—CloudFactory, CrowdFlower, Twilio, and GitHub. Ten teams spent the day intensely coding, absorbing the energy of their fellow hackers, and developing prototypes of computer applications that incorporate human computation. Hackathon participants went home to sleep while crowds of workers across the world worked through the data-processing tasks that were designed into the apps.

The winning projects, later described on stage and in press releases, drew on commonsense notions of good or "cool" circulating at the San Francisco Bay Area conference. One winning team built an app that rated photographs of moles for melanoma; the app employed CrowdFlower's APIs to connect to workers in Nepal, who rated each photo for signs of melanoma. Another winning project used barometers on people's Android phones to collect and aggregate weather data. A third winner developed an app called "Clean up India." The developer used CloudFactory's APIs to recruit people in India to go outside and tidy up a park or street. Workers sent before and after photographs as evidence of their labors. Press releases after the conference advertised the apps. The conference organizers also announced the winning applications immediately after a panel on how crowdsourcing generated "philanthropy" by hiring workers in poorer countries.

CloudFactory explored how programmers—from different companies, with varied cultural imaginations—might make use of the digitally mediated labor platforms evangelized by the tech industry. Like the design studio and water hackathons, this hackathon invited participants to draw on their own knowledge, networks and desires to generate the seeds of future technologies. Like those other hackathons, this one asked participants to dream in forms that made existing infrastructural investment—here, in crowdsourcing APIs—relevant and valuable. Specifically, the infrastructure here was not only the Internet but the computationally organized labor of far-flung others—people available to work at costs lower than those already in the organized sector. By spectacularly demonstrating what good could come of crowdsourcing, hackathon winners bolstered the legitimacy of an industry and an infrastructure hampered by concerns about the ethics of globalized IT and labor.

Hackathons and the Production of Inclusion

The hackathons described here offer an insight into the politics of inclusive development through processes of software production. In each of the three cases, the conveners framed hackathons as sites of participation and inclusion. Inclusion, a watchword of development since the first years of this century, can mean many things and head off many possible critiques of globalization and development.

The Legitimacy of the Inclusion

In one sense, hackathons promise inclusion by opening innovation to the desires of those beyond the walls of private firms. A hackathon can convene people to make a technology seem like a platform that empowers local actors to create, rather than being perceived as the imposition of a mediating technology in a social space.

CrowdHack promised this form of inclusion by inviting academics and Bay Area software engineers to play on CloudFactory's platform in the presence of the company's founders. As people hacked on CloudFactory's platform, they could make suggestions to the company about how to improve it. Their hacking generated knowledge with which CloudFactory engineers could valorize their platform. The company selected and publicized the top hacks to publicize, legitimize, and hype their platform and crowdsourcing sector systems more widely (Sunder Rajan 2006; Chan 2013). Inclusion, here, functioned to harvest tacit knowledge and cultural sensibilities from those beyond the firm's walls. The hackathon was an instrument to facilitate this harvesting for the valorization of the crowd platform. Here, hackathons fit with a wide range of corporate techniques for harvesting innovative uses and knowledge from beyond the firm. These techniques are often popularized and formalized as "open innovation" (Von Hippel 2005).

The World Bank hackathon generated not only knowledge, but also legitimacy for the enterprise of development. The bank had long faced criticism for the performance and politics of its top-down projects. Decisions from the top frequently mismatched the needs and social desires at the grassroots (Rao and Walton 2004). This discourse of development located the West as the source from which development knowledge and modern forms of life diffused (Escobar 1991). The shifts to participatory development (Cornwall 2000) and "community-centered approaches" (Escobar 1991) were two responses to this. Microfinance and "bottom of the pyramid" approaches that invest in the poor as entrepreneurs were another (Elyachar 2012). The World Bank hackathon also appeared to empower middle-class professionals—another answer to these critiques. The bank, in *Water Hackathon: Lessons Learned*, emphasized the importance of the "local" in making the global through the language of "authenticity" (World Bank 2012b, 11). "A local tech partner," the paper advised, could not only help with local arrangements but also "lend authenticity" to the event (11).

Furthermore, "Hackathons," the guide warned, "should not come across as a branding exercise." The organizers designed these hackathons as socio-technical devices to harness and fabricate authentic, local, and inventive energy and vision.

Of the three hackathons described in this chapter, the Delhi hackathon appears to be the most "authentic" following the language of the bank's white paper. The event was associated only with small Delhi firms, NGOs, and the British Council—a European cultural funder, but hardly one with the clout of the bank. Even then, the relative modesty of the hackathon bound participants to pre-existing Internet infrastructures that had been developed for wealthy places and people.

Leveraging the Local

The World Bank white paper framed hackathons as a way to "leverage" the local: local knowledge, local networks, and "local champions" in the service of bank goals and policy agendas (however negotiated). The bank acted not alone but in partnership with a range of multinational technology organizations. The bank commissioned an organization called Random Hacks of Kindness (RHoK) to organize the events and report lessons in the white paper. RHoK draws together resources from Microsoft, Google, Yahoo!, NASA, and the World Bank. What does this coalition leverage when it leverages the local?

From local knowledge, hackathon participants can generate possible ideas for software. They can identify risks to the success of the software, as well as possible desires the software might speak to. Hackathons are also a way by which conveners can open themselves to people from different social worlds. This contact zone between social worlds is not just a matter of good politics. It is a matter of recognizing value. Innovation is not the making of new things alone, Stark argues. Instead, it is recognizing what might be of value among many new things. Hackathons are one kind of organization where people come together in "heterarchy" (Stark 2009), bringing their varied understandings of worth to bear on the direction a project should take. Stark analyzed New York startups in the early days of the web, as workers, investors, and CEOs scrambled to search for what the web might be worth to US customers (Stark 2009, 81–111; see also Neff 2012). Teams within the startups Stark studied heterarchically convened designers, programmers, and marketers to assess germs of products according to varied

regimes of worth. As ephemeral convenings, hackathons allow an organization to draw near a wider range of perspectives than available within the firm. For the convening organization, the talk and demonstrations at a hackathon can bring previously unrecognizable forms of value into view. It is a mistake, then, to see hackathons as only generating innovation from participants. They also allow conveners to innovate by allowing them to "leverage" varied local epistemes and cultural understandings.

Hackathon participants also bring their local networks and relationships into the room, including business relationships, trusted friendships, and family members—people through whom knowledge, investment, patronage, and regard might flow. Anthropologists have drawn attention to how development enterprises need to understand and mobilize existing social relationships—social relationships that exceed the developmental and economic templates of individuals in modern society. Jamie Cross and Anita Chan, for example, show how the One Laptop Per Child and solar lantern projects have become occasions for NGOs and companies to explore and create partnerships (Chan 2013, 189; Cross 2013). Julia Elyachar draws attention to how NGOs map and mobilize social relations among the poor, whether in Cairo's neighborhoods or in self-help groups in India, as "phatic" program infrastructure (2010). Elyachar argues that we ought to recognize these social relations as the product of "phatic labor"—the labor of everyday sociality that creates potential value (2010, 457). Through hackathons, conveners hope to draw close partners that might also bring near other pre-existing social relationships that can diversify the reach of the conveners' platforms. Hackathons need not completely subsume social relationships into the production of capital. Innovation requires difference; hackathons offer one way for capitalist production to tap into difference without taking responsibility for its shape or sustenance.

Hackathons leverage the local in a third way, as they convene what the bank report calls "local champions." A champion is an individual—driven by passion—who pushes, pushes, pushes to see an innovation adopted. The language of champions comes from Peters and Waterman (1984), eminent business consultants, and earlier, from theorist of innovation Donald Schoen (1963).[1] In searching for champions, institutions attempt to locate and marshal individuals, not for their labor time alone, but for the intensity of that labor as affective drive (see Vora 2015). A champion does not

simply offer affective labor. A champion is one who will navigate obstacles, scheme, and hustle to pursue a goal. From among hopeful hackathon participants, the World Bank sought those motivated local translators and "non-traditional partners" who could move the bank's institutional interests forward (World Bank 2012b, 7).

These passions offer no guarantees of progressive outcomes. The World Bank taps human capacities to care for others through technology. It draws on locality to generate novel differences that might matter to people—those relevant information products that some might adopt. But these "local" forms of knowledge and affect can equally be humanitarian passion, ethnonationalist affect, an impulse to order others, or personal aspiration. Those affects are already stirred up through histories of capitalism, neoliberalism, and postcolonial nationalism. Hackathons channel those affects toward valorizing organizations' infrastructural investments.

Who Mediates the Local?

In asking who wins and who loses with hackathons, we should also ask who can participate in hackathons at all. Who mediates the "localization" of a global form (Mazzarella 2003)? Hackathon teams rely on easy and fast social relations to proceed. The Delhi hackathon allowed no time to do the "real footwork" of developing partnerships with other organizations and activists, work that did not fit within the scope of the hackathon. Though we could build some software in a couple of days, we had little time to explain our developing goals to members of activist networks. There was no time to build coalitions, align frames (Snow et al. 1986), or build trust with activists, NGO workers, landless villagers, or frustrated city dwellers. To get to the demo in five days, the people coming together had to be sufficiently similar, sufficiently flexible, and sufficiently few. The hackathon required fast trust and fast talk. The participants all spoke English fluently.[2] Even if hackathon team members share an alternative common language, English is the dominant language in programming worlds of practice (Takhteyev 2012). Major operating systems, programming languages, and toolkits require some interaction in English.

Hackathons also pull people away from spending time at home, getting rest, and caring for those not at the hackathon. The events rarely provide alternative care arrangements to substitute for the time participants put into the events. By contrast, hackathons often celebrate the self-sacrifice

of actors who are willing to hack away a weekend with only pizzas as payment.[3] The Delhi hackathon attracted young, college-educated people without family obligations. In the name of participation, hackathons often fail to account for the forms of habitus and networks of care that enable some to participate while others cannot afford the luxury. Similarly, Crowd-Hack invited programmers, not human computation workers, to imagine the future of technology. The capacity to hack for days is, in part, the capacity to deprioritize one's obligations to others and direct one's attention to a landscape of IT infrastructures that have already been shaped elsewhere. At hackathons, institutions and firms stage openness while eliding histories of privilege that enable people to participate.

Cultivating Platform Dependence

In the name of local innovation, the three hackathons described in this chapter ultimately relied on pre-existing platforms to innovate. The World Bank hackathon and CrowdHack explicitly evangelized platforms. The Delhi hackathon conveners had no intention to evangelize a platform. We discovered in the work of hacking, however, that we had to rely on existing Internet and Web 2.0 code libraries and platforms. The very premise of a hackathon is that one can build intensely and quickly by drawing on a large stock of extant platform infrastructure. When our interests shifted to more broadly accessible and maintainable radio technology, there was no time to build, extend, or sustain such an infrastructure. The time pressures common to hackathons required us to forge ahead with infrastructures that were already dominant and ready-to-hand. Limited time forced us to pursue what the World Bank white paper calls "the low hanging opportunities" (World Bank 2012b, 15).

In computer science, this mode of problem solving is referred to as the "greedy algorithm." The bias to choose the easiest path often leads to less optimal solutions. The Delhi hackathon made clear that low-power radio would never be the lowest hanging fruit. This strategy of problem solving leads entrepreneurial technology makers to reaffirm the dominance of already dominant players, extending their reach into new niches of culture, imagination, and life rather than creating alternatives to such platform dependence.

Conclusion

In "Gens: A Feminist Manifesto for the Study of Capitalism," Laura Bear, Karen Ho, Anna Tsing, and Sylvia Yanagisako (2015) argue against accounts of capitalism that homogenize the multiple temporalities, spatialities, and relationalities that constitute life. Anna Tsing shows how global projects of capital generate "friction" when they hit the ground (2005). Supply chains are one way in which capitalists and their agents organize the movements of labor, materials, and people to manage these frictions and differences (Tsing 2009). Hackathons, I argue, are another.

Projects around digital economies often claim what scholar Anita Chan (2013) calls "the myth of digital universalism." Information technologies can seem multifunctional and "general purpose" (Brynjolfsson and McAfee 2014). As these projects work to commodify knowledge as code, patents, and information objects, they too encounter differences that can reveal the universalism as myth. Chan calls for a "digital interrupt" to draw attention to the frictions, protests, and difference that refuse to be subsumed into knowledge economy projects (2013, 177–194).

Hackathons, I argue, are one technique by which those invested in the Internet attempt to make it a global technology. Elsewhere, I have argued that hackathons can be pedagogical mechanisms. The hackathon in Delhi was part of a large festival of arts, technology, and even NGO events that evangelized an entrepreneurial ethos (Irani 2015b). The hackathon unfolded in a wider context of social impact competitions, philanthro-capitalism, and the rearticulation of Indian nationalism as the success of technology capitalists. The event offered an embodied, temporally compressed education in how to collaborate in small groups to take authoritative, visionary action. These hackathons build capabilities but also tap into the capabilities and relationships people have to expand the capacities of a given infrastructure. In convening participants to hack around institutional challenges, hackathons immerse participants in the problem framings offered by the institution. The manufactured urgency of these events recasts a highly delimited call to work on an institution's terms as effervescent challenge and journey. This urgency compresses deliberation. It celebrates those who can adapt to entrenched interests and make opportunity out of austerity.

Organizations invite people to bring difference out into the open and make it available for software innovation through the hackathon. Hackathons are one way organizations make difference knowable, manageable, and even profitable (Sanyal 2007, 96–97). Difference might be varied knowledge, or the diverse social relations people mobilize in their local worlds. Conveners of hackathons might glean ideas and knowledge from event participants. They might hire promising teams, drawing closer members' existing social relations and cultural knowledge, and possibly even neutralizing them as competitors. Hackathons are not threatened by difference. They are one way institutions can selectively cultivate and support certain forms of difference as a mode of governance far softer than enforcement or discipline. Difference, then, is not necessarily a "digital interrupt" (Chan 2013). By drawing difference near, hackathons help convening firms and institutions expand their influence by incorporating difference into their engines of value.

Sociologists of hackers Johan Söderberg and Alessandro Delfanti (2015) locate a hacker ethos in the desire to turn technologies toward ends other than those originally intended. But as hackers lose their definition as a social movement group, with common goals and identity, they fragment into a multiplicity of users, causes, and issues. The more they become a divided multiplicity, Söderberg and Delfanti argue, "the more reliable source of innovation for firms they become" (2015, 795). These participants become resources for organizations, but hackathons offer paper thin resources for the participants. Participants offer their hope, their energy, and their knowledge. Yes, they experience the jouissance and craft of hacking (Coleman 2013). But what should participants do when they hit the limits of fast work? What should they do when they run up against the limits set by existing infrastructural investments? Perhaps we can turn the hackathon from a site of experimental, innovative production to a site of movement building. When we run up against the limits of what we can accomplish by accepting the resources already given, perhaps we can organize beyond our teams to demand more from development than making value out of what more powerful entities have assented to provide.

Notes

1. By the early twenty-first century, the canonical *Diffusion of Innovations*, by Everett Rogers (2003), had drawn the concept into the 5th edition.

2. Despite India's global visibility as an English-language service exporter, English skills are rare. Only 4 percent of Indians between eighteen and sixty-five spoke English fluently in 2005, and those fluent speakers were primarily members of the upper castes (Azam, Chin, and Prakash 2013).

3. Gloria Lin's (2016) undergraduate thesis argues that hackathons leave little time and room for the care of self and others, preventing participation from a more diverse range of people.

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