Policy

Capital, Power, and the Next Step in Decentralization[1]

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The core attribute of the networked information environment has been the radical decentralization of the capital structure of information, knowledge, and cultural production. Beginning in the second quarter of the 19th century, the expansion of markets and polities, combined with the development of such capital-intensive information production technologies as mechanical presses, as well as with processes like the professionalized press, drove effective engagement in information production and exchange toward an industrial model. From double-entry bookkeeping to the major accounting firms, from the telegraph to the mainframe, and from the phonograph to the 24-hour cable channel, information production and exchange centered on an industrial model, driven by the need to secure and sustain substantial, concentrated funding.

The personal computer connected to the Internet changed the basic capitalization model for information, knowledge, and cultural production. The most important inputs into the core economic activities of the wealthiest economies came to be widely distributed in the population. Computation, communications, storage, sensing, and capture devices are now widely distributed in the population. These, in turn, enable the effective deployment of the other core inputs into the global information economy: human creativity, wisdom, insight, and perspective.

Many of the most interesting phenomena we have observed over the past decade-plus in production, socialization, and politics have flowed from the basic change in the capital structure of information production. People have always been complex, generous, and social. But effective organization around developing an operating system or an encyclopedia requires access to material capital and organizational channels that have burdened, even retarded, people's abilities to come together to act effectively. People have always worried and argued about their political condition, and have been able to come together in moments of great arousal to move politics. But the day-to-day business of government watchdogging, of investigation, and of opinion crystallization has been professionalized throughout the rise of democracy in the last century. The fact that much of the population in the wealthier economies has at its disposal the most important physical inputs, together with the training to use them, has catalyzed the basic changes in those dynamics.

The understanding that the core change is one of radically distributed capitalization should shape our understanding of the next generation of challenges to the use of information technology for development. If the first benefits of ICTs for development were captured by the image of

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fishermen calling ahead and negotiating the price of fish before they pulled into port so as to capture greater returns for their families, the next generation is likely to consist of deployment of the much more flexible and dynamic affordances of more powerful computational devices, cloud applications, and social software or organizational tools. But these new tools have, up to this point, depended on the widespread availability of more powerful computational devices than the mobile phones of the first generation. In wealthier economies, this did not pose a basic, overarching problem, because the devices were within reach of large numbers of the population. The problem of the digital divide existed and exists in wealthier economies, and it poses challenges of equity and justice, but it was not sufficient to prevent broad, societal adoption of the practices enabled by this decentralized capitalization, nor in turn, to prevent the structural changes we have seen. The concern with poorer economies is that far more people simply cannot afford the basic computation and communications devices necessary to use the more complex affordances. It is, therefore, far from clear that ICT deployment in poorer countries will deliver more than a portion of the benefits of the new information environment. The benefits that are delivered are likely to come without enabling the basic shift in the locus of capabilities that accompany widespread distribution, throughout the population, of open, flexible, high-capacity computation and communications devices.

In wealthier economies, computers are mid-grained capital goods. They can be put into service by individuals or households. As a result, access and deployment are either individually controlled or controlled at the level of (nontrivial) household power dynamics. In a poorer economy, the same computer may be put in service at the level of a village, or a cluster of homes, or a local entrepreneur's kiosk. In that context, the risk is that the existing distribution of power and control over the ability to muster the investment will determine who controls the computing capabilities, leading the new computing infrastructure to replicate the very same power dynamics that determined who owned the computer and who controls access to it in the first place. Although this pattern of investment would still make access to global and national markets available to a greater extent than is feasible without the introduction of networked computers, it would harbor a less radical destabilization of traditional power hierarchies, and a less radical redistribution of capabilities.

Mobile phones alone will not solve the problem. A major reason that mobile phones were a successful early ICT platform in poorer countries is that they are much cheaper; they rely on networks that run all the intelligence in the network, allowing for very cheap edge devices. Yet it was precisely the simplicity of the network relative to the intelligence or computational complexity of the edge devices that characterized the Internet, something that was critical to the development of the network information economy and society. A drive to make cheap devices available throughout poorer countries that does not take into account whether the cheapness comes at the expense of a truly open, neutral network will result in a very different kind of ICT platform from the one we imagine as being so creative and productive in the wealthier economies.

We today, in wealthier economies, cannot be neutral between a next-generation network that evolves from mobile phones to smartphones and depends on proprietary networks with greater control over information flows, and a next generation that evolves from personal computers in an open, nonproprietary network. Mobile devices are rooted in networks whose engineering, regulatory, and business models embrace controlled infrastructure, proprietary devices, and software controlled by the operator. PCs connected over the Internet were developed on an engineering, business, and regulatory background that assumed openness and neutrality. History may not be destiny, but it certainly matters.

It is possible that a networked environment built using smartphones over proprietary cellular networks could emulate the openness of the PC-based Internet. Such an endeavor would require either an act of coordinated business decisions on a large-scale, strategic basis—say, that Apple would give up its control over apps, and that the network operators would seek no control over them—or an act of forceful regulatory intervention to require open, nondiscriminatory policies from network operators and device manufacturers alike, or the emergence of an open strategy like Google's Android as the de facto standard. The last scenario depends, of course, on Google not being tempted to use the control levers available in cellular proprietary networks.

It is similarly possible that a noncompetitive

broadband network, connected to PCs, could be designed away from open Internet design, and that the politics of net neutrality regulation would be such that no regulatory intervention would be available to avoid this eventuality.

Although both of these options are feasible, and we have examples of business models that seek to pursue each, the path of least resistance in the mobile space is for an extension and continuation of relatively controlled platforms, and the path of least resistance for a PC-based network is toward a more open infrastructure. Only open systems of the latter type will preserve and extend the kinds of open, collaborative, distributed practices that have been at the core of what made the Internet transformative.

As we move toward a ubiquitous, mobile Internet, emphasizing the PC-like open, generative platform connected through a neutral, open network should be a point of primary focus. In countries where mobile devices are the most likely viable path to widespread adoption, this puts a heavy burden indeed on those pushing deployment to counter the control-oriented legacy of those systems.

As we think of ICTs for development, then, we must focus on the widespread distribution of not only high-capacity devices, but *open* high-capacity devices in the hands of a highly skilled population, over open networks running simple and nonproprietary standards. Devices must be cheap enough to be widely distributed as basic background features, owned by individuals in a pattern uncorrelated with existing power relations. Devices must be accompanied by training in their use and in use of the network, so that people do not fall back on the simpler devices that deliver more predictable, controlled, and "safe" applications. In the near future, this may mean programs focused on women, as microlending has been, or on youth and children.

Together with open devices, open networks, and skills, it is important to provide adequate access to information, knowledge, and cultural materials. Some possible sources for this could be open-access scientific journals and educational materials, free and open source software, and a robust public domain of freely accessible cultural materials, both local and global, upon which users can build to create their own new expressions. Achieving this latter component will require, among other efforts, political work in the wealthier economies to abandon or at least moderate the trade and intellectual property policies that have imposed increasingly higher levels of protection. Less restrictive models of treating knowledge goods are more appropriate for a development agenda.

The networked information economy and society promise a radical shift in power and capabilities from industrial, centralized forms to decentralized forms that counterbalance market dynamics more effectively with social dynamics. To achieve this, a highly distributed physical and human capital structure is necessary, connected to an open and robust network of information, knowledge, and cultural resources. Achieving such an open strategy will require a development policy that goes beyond the widespread availability of devices and physical network connections to emphasize the openness of the systems, the skills necessary to navigate them, and the feasibility of an institutional framework that supports an open core common infrastructure for both physical and knowledge resources. ■