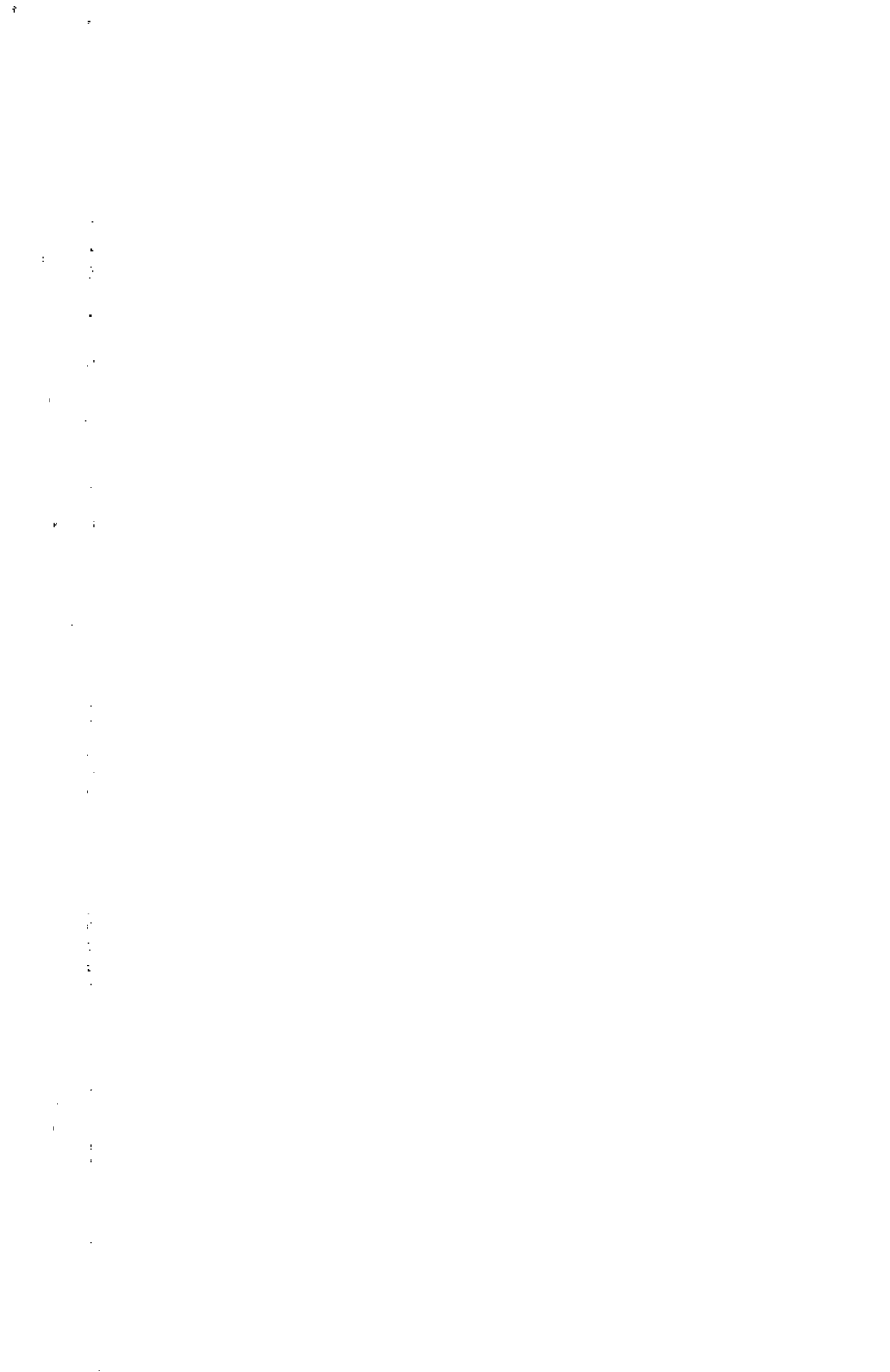


16. Information Technology and Urban Poverty: The Role of Public Policy

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There are no "technological fixes" for America's inner-city problems; social engineering has its limits; policy outcomes rarely, if ever, match policy objectives; and policies are rarely crafted neutrally by the dictum of so-called public interest. All this we knew when, at the Department of Urban Planning at MIT, we organized a colloquium on Advanced Information Technology and Low-Income Communities.

The aim of the colloquium was to provoke new analyses and generate some innovative policies. The colloquium was to serve as a conversation between academics and activists, equally engaged in understanding information technology (IT) from very different perspectives. The academic's view would offer a view from "the top," rooted in an analysis of global socio-technological-economic trends hinged on the rise of IT, and an appreciation of the likely effects of these trends on low-income urban populations and communities. In contrast, the community activists would provide a view from "the bottom" that would be rich in details about individuals and communities, the many constraints they face in their day-to-day lives, and how these constraints influence IT's impact on them. The view from the bottom was to complement the view from the top: the global, generalized, and highly abstract analysis was to be synthesized with the concrete, detailed stories of how individuals and communities were responding to the new technological possibilities. Such a synthesis, we had hoped, would generate innovative policy suggestions through a blend of the academics' theoretical and formal knowledge with the practice-based, fine-grained wisdom of the activists.

Although the colloquium spanned an entire semester and involved weekly presentations by academics and activists, it fell somewhat short of generating a real dialogue between the two groups. The mood among the academics, documented in Part I, was generally pessimistic. They saw urban poverty as worsening and argued that IT will do little to improve—and much to worsen this situation—except insofar as we can better educate and train the poor, especially in computer skills, to compete for entry-level positions in IT firms. In contrast, the activists were eager to learn about IT's intricacies, hoping to capture some of the new technological power of rapid communication for the benefit of their communities. The activist's eagerness was somewhat surprising, because in the past they had been deeply skeptical about whether technological innovations could ever lead

to socially progressive outcomes. But as became evident during the colloquium, community activists are now concerned that at a time of declining government funding for inner cities, communities lacking electronic access to resource announcements will be disadvantaged in competing for scarce resources. The activists are correct to assume that as the pressure on government mounts to reduce expenditures by streamlining its operations, it is quite likely that, much like business operations, government agencies will be forced to shift to electronic communication mode to reduce costs and increase productivity.

The activists have additional reasons for their enthusiasm for IT, as we learned during the colloquium. Community activists worry that if they fail to make the transition to the new communication mode, they will be thought of as being stuck in the old mode of community organizing, creating a negative image that will hurt their capability to mobilize resources. The activists are also aware of the intense competition for government resources under the new regime of fiscal federalism. They know that quick, up-to-date information on government programs is essential to compete for declining resources. Another reason, which revealed the most about the current condition of low-income communities, is that activists cannot build a critical mass of support for their efforts by relying only on the spatial community to which they belong. Access to IT would provide the opportunity for community leaders to build a critical mass by drawing support from across the country without having to assemble everyone at the same time and place. All these reasons contributed to the activists' enthusiasm to learn about IT, even though the academics warned against the myth of technological utopianism and argued that IT is unlikely to alter the conditions of the urban poor who remain marginalized and isolated by social, political, and economic changes currently under way.

Despite the colloquium participants' difference in attitude toward IT, we did arrive at some points of agreement. These points of agreement were not explicitly articulated during the colloquium, rather, they are implicit in the discussions that followed the regular presentation of papers in the colloquium. We have grouped these areas of agreement into five parts. First, we describe two unique characteristics of the digital revolution—namely, its interactive potential and decentralizing nature,

which offers the poor a new set of opportunities for social and economic integration. Second, we describe why the colloquium participants unanimously agreed that universal access to IT is essential and why the market if left to itself will not provide such access. Third, we analyze briefly current government policies regarding IT and find them inadequate for ensuring universal access. Fourth, we put forward a set of policies necessary for channeling IT's benefits toward low-income areas. Fifth, we conclude with some remarks about what kind of research is necessary to devise policies sensitive to the particular needs of the poor.

Technology and Social Progress: New Opportunities

The colloquium participants acknowledged that IT is not a discrete technological invention, but rather a broad-gauged sociotechnological system advancing in a wave over all of society, analogous to earlier systems such as those associated with industrial production, the railroad, or the automobile. We cannot forecast precisely what this new digital electronic revolution will bring for society as a whole or for its low-income communities in particular. But we believed big changes were in the offing: that IT will alter the way markets function, the mechanisms of governance, even family and social interactions. These changes will come incrementally into different aspects of our lives, but their impact will be so vast over time that, say, fifty years from now our lives will indeed be radically transformed.

We, as a society and as individuals, can choose how we shall think and act in relation to the digital revolution. But one thing is clear: to profit from the potentials opened up by IT—whatever they may be—we must participate in it. This is especially true for the poor, who are already excluded from the economic, social, and cultural mainstream. They must be helped to participate in the digital world in a variety of ways. In the economic sphere, the poor must be included in the informational economy—as employees or as entrepreneurs. They must receive better education, for which IT offers important potential in the form of educational uses of the Net, e-mail communication between teachers and students, and electronic self-paced education. In the social sphere, too, IT offers the urban poor a new set of opportunities because of two unique characteristics—namely, IT's interactive potential and decentralizing nature. Unlike television and

radio, IT offers the opportunity for interaction between the computer and its user, creating the conditions necessary for learning, confidence building and self-empowerment. As Bruno Tardieu and Jeanne Bamberger describe in Part II, computers, if used with empathy, can reduce the poor's sense of disempowerment and give them the confidence necessary for continued learning. Likewise, IT's decentralizing nature offers the poor an opportunity to be entrepreneurial. Unlike earlier waves of technological innovation, such as the industrial revolution, IT lends itself to multiple, local variations, and to the exercises of multiple forms of local control. With the World Wide Web, every user has the potential of becoming a broadcaster. Further, the new network technology opens up hitherto unrealized potentials for communication. Every individual has the potential for discovering and making connections with other individuals of like interest and mind. And, the technologies of the Internet and the computer open up essentially endless possibilities for customization. These possibilities, as Alan and Michelle Shaw point out in Part II, offer a new opportunity for grassroots communication among individuals and groups striving to re-create a strong community of place.

For Joseph Ferreira and Michael Shiffer, who contributed to Part II of this volume, IT offers even more to the urban poor. They demonstrate that the computer may function as a repository of information, accessible by grassroots neighborhood planners. The Internet can function as a digital communications network for neighborhood discussion and debate. It can also facilitate reciprocal exchange of information between local and central sources, as the poor gain the ability to enrich the central database with their local knowledge. Shiffer also describes the multimedia, multirepresentational capabilities of the computer that enable it to make planning and policy reports "come alive" for neighborhood residents, and enable those residents to present themselves, their communities, and their views on urban issues to the world outside the neighborhood.

Universal Access and Public Policy

To capture IT's potential for the benefit of the poor requires that they be connected to the digital world. Hence the key policy issue is one of access to this world. As William Mitchell argues in Part II, access is more than

personal computers: it requires infrastructure, affordable hardware, user-friendly software, and the will and motivation to employ them. Not surprisingly, access to IT is unequally distributed between the well-to-do and the poor. Indeed, the world is comprised of computer haves and have-nots. The objective of public policy should be to bridge this gap.

In this regard, the current situation is somewhat gray, as we came to appreciate during the colloquium. On one hand, the costs of hardware and software are on a downward spiral. As Mitchell Kapor pointed out in one session, this technology is sensitive to the same supply and demand conditions as other goods and services—when something is available in surplus, the price goes down. Much like telephone and television, IT may eventually become part of the daily life of everyone, including the poor. This is not mere wishful thinking. As Kapor described, two distinct trends in the digital world offer this opportunity. First, there is a growing technological convergence whereby telephone, cable, and computer services can be provided together efficiently and at reasonable cost to the consumer. The set-top box, which turns the living room television into a computer monitor, is an example of this. The second trend, which complements the first, is a convergence in the industry structure, as firms that once provided telephones, cable, or computer-related services are increasingly seeking to move into one another's territories—a trend that has been facilitated by the deregulation of the telecommunications industry since 1996. Under ideal circumstances, these two trends could lead to a higher level of efficiency in the production and delivery of services, which in turn should lower the marginal cost of providing these services to low-income areas.

On the downside, a number of trends suggest that the market alone cannot provide the poor with access to the digital world, and, even if access is provided, it is unclear whether it will be enough to integrate them into the nation's mainstream economic, political, and social life. First, technological convergence is not inevitable. Without some government support, private firms may be reluctant to invest in technological innovations with property rights that cannot be controlled. Second, the convergence in industry structure may not lead to cost reduction. On the contrary, it may reduce competition and increase the price of telecommunication services. (After all, the deregulation of the telecommunications industry did not reduce the price for local cable services!) And, if the price

of telecommunication services increase without a concomitant increase in real income of the poor, private firms may be reluctant to cater to poor communities. This makes the danger of "digital redlining" quite real.

There are additional reasons to be concerned about whether market mechanisms would eventually provide the poor access to the digital world. As Alice Amsden and Jon Collins Clarke note, in recent years only a few large firms have generated the major innovations—unlike in the early stages of the digital revolution when technological innovations emerged from a relatively more open system with many small innovators. One reason for this change from the "blooming of a thousand flowers" to the dominance of a few is that innovations in IT now require a large amount of finance capital as well as extensive social capital. This prohibits entrepreneurship at the bottom, and discourages innovations geared to the specific needs of the poor.

Another obstacle to universal access may be the lack of social infrastructure. Unlike electronic infrastructure, which has received some attention from policymakers, social infrastructure, or lack thereof, has received relatively little attention in policy discourse. But, as William Mitchell, Anne Beamish, Bruno Tardieu, Jeanne Bamberger, and Alan and Michelle Shaw argue in Part II, provision of adequate social infrastructure is a key prerequisite for capturing IT's benefits for the poor. By social infrastructure we mean good schools, well-equipped community centers, and, most important, educated and technology-receptive individuals, both children and adults who are capable of fully exploiting IT's interactive potential. Without such social infrastructure in place, no amount of electronic infrastructure and affordable hardware and software can ensure that the benefits of universal access will reach the poor. Tardieu elaborates on this point in Part II where he demonstrates why improved education is not simply a matter of connecting all schools to the Internet. Tardieu argues that in the absence of good teachers who can show the students how to use IT for confidence building, learning, and self-empowerment, inner-city children will become mere "consumers of technology," spending time and money on electronic video games. In contrast, children who attend good schools in upper-income communities will learn to utilize the same technology to organize their knowledge, create data banks, and search them. This will challenge their minds and build self-confidence. The point for our

purposes is: Can schools in low-income areas afford to employ an adequate number of good teachers to guide their students to utilize IT in a productive way? Our colloquium participants were uniformly skeptical that under the current funding system of public schools, which relies heavily on property taxes from the area residents, schools in poor areas will ever be able to provide the kind of education necessary for tapping IT's full potential.

In a similar vein, Anne Beamish argues that to ensure the poor's access to the digital world, efforts must be made to connect public libraries, community centers, and ultimately individual households to telecommunication infrastructure. This too will require more than the provision of computers. At the household level, low-income families are unlikely to make a quick transition to the electronic communication mode even if the benefits would appear to be significant. Ironically, what would be required to make the transition is traditional, door-to-door campaigning by community activists who must patiently explain how to utilize personal computers and demonstrate how they would provide access to information vital to the well being of the poor families. Likewise, community centers and libraries too would also require assistance to switch to the new communication mode. These public facilities would need resources not only to acquire computers and user-friendly software, but also to employ an adequate number of trainers who are willing and able to help the users make the transition. And, as Anne Beamish notes, this kind of support cannot be in the form of one-time assistance only. With rapid technological advancement, old computer programs soon become obsolete; hence new programs must be installed periodically. Similarly, old computers have to be replaced with new computers with more capabilities. Without such regular improvements and maintenance of computer facilities, community centers and libraries in low-income areas are not likely to be of much use to area residents even if they are equipped with computers.

The Inadequacy of Current Government Policies

What has the government's response been to the challenges posed by the digital revolution? At the federal level, government policy has evolved gradually from Vice President Al Gore's 1993 proposal for an information superhighway¹ to President Bill Clinton's proclamation in the 1996 State

of the Union Address to connect all schools to the Internet by the year 2000. This policy evolution from preoccupation with the information superhighway to attention to schools was accompanied by two congressional efforts to address IT-related issues: first, the National Information Infrastructure Advisory Council (NIIAC) was created in 1995; and second, both the Telecommunication Reform Bill and the Communications Decency Act were passed in 1996.³

At first glance, the NIIAC reports³ may appear to address the concerns of poor families in inner-city areas. The Kick Start Initiative, for example, states that all schools, community centers, and other local institutions should be connected to the Internet to provide a new channel for civic participation. It does not, however, recommend any bold steps by the federal government to achieve this outcome: the initiative merely advises communities that they should make individual efforts toward this objective, given that there are success stories of such efforts at the local level. But since not all cities and towns are equipped with the same level of financial and human resources, how likely is it that, without sustained and significant support from either the state or federal government, the disadvantaged communities will achieve the goal of connecting local institutions to the Internet? And, as mentioned earlier, access to the Internet may be a necessary but definitely not a sufficient condition for educational improvement or civic participation. Schools, as well as neighborhoods, need teachers and activists who can use the technology to, in Tardieu's words, turn the students and residents from being simply consumers to producers of knowledge.

According to Mitchell Kapor, an original member of the NIIAC and a participant in our colloquium, the main purpose of the NIIAC and its reports was not to address how to wire schools and community centers. Instead, NIIAC's central objective was to respond to the concerns of the intellectual property interests in Hollywood who pushed for copyright laws to protect against loss of revenue, not to draw the nation's attention to obstacles that low-income communities must overcome to participate equally in the technological revolution.⁴ Consequently, because the NIIAC did not address the key issue of how to achieve universal coverage, Kapor argued that they missed an opportunity to take advantage of the techno-

logical and industry convergence that was taking place to devise new and effective public policies.

The sponsors of the Telecommunications Reform Bill in 1996 were equally oblivious to the needs of the poor. The bill opened up competition in various sectors, such as local telephone and cable television, which may eventually lead to price reductions for all consumers; but, in the main, the bill's proponents were not motivated by a concern for the disadvantaged. As Kapor argued persuasively in the colloquium, the reform bill was primarily "a business deal" among the major players in the telecommunications industry who wanted to expand into one another's market territory. Nothing in this bill improves or guarantees the poor's access to telecommunications services. On the contrary, with deregulation universal service is likely to be even more difficult to enforce without large-scale subsidies, which are politically unpopular these days. As a result, it is quite plausible that low-income communities will be underserved or, worse, not served at all.

Policymakers have not totally ignored the possibility that the digital revolution may bypass low-income communities. So far, however, the efforts to rectify the situation have been rather limited compared to the scope of the problem. For example, at the local level, many cities participated in Net Day⁵ by wiring some public schools to the Internet. Such efforts depend primarily on voluntary support, in cash and kind. To generate voluntary support, cities have relied on local universities, well-established private firms, and wealthy philanthropists. The federal and state governments have applauded this sort of effort by cities because it fits in well with the current national mood to shift fiscal and other responsibilities from the federal to the state and local levels. Not surprisingly, the impact of the locally sponsored Net Days has been spotty and somewhat regressive, because local authorities have been reluctant to take on the difficult task of technologically upgrading the most backward schools with the fewest resources.

In sum, federal government policies regarding IT have been motivated largely by business interests, with some concern that the new technology should not further accentuate the existing inequality in educational opportunities among children. The federal government has

been more concerned, however, about the morality of its citizens. The enactment of the Communications Decency Act is an example of the federal government's deep concern that IT may have a serious adverse effect on the morality of teenagers who may gain access to "immoral material" via the Internet and the Web. Similar acts enforcing universal coverage of all citizens is yet to be proposed, although there are precedents of such efforts that ensured access of the poor to basic utilities in the past.

One reason why government at all levels has not actively ensured universal access is because politicians and policymakers have not yet comprehended fully IT's likely impact on relative distribution of life chances among all citizens. To date the government's approach to IT has been conditioned by the assumption that the adaptation of digital technology is crucial for business productivity; its impact on the poor has not been of particular concern because of the pervasive belief that none of the immediate problems of urban poverty can be addressed by IT. Policymakers continue to believe that the glaring symptoms of urban poverty—drug use, badly maintained public housing, welfare dependency, out-of-wedlock births, and so on—cannot be addressed by ensuring universal access to IT. The current national understanding is that these problems require better policing, more prisons, stringent laws against "deadbeat dads," and a new welfare system that would force the unemployed poor to work to earn a living. Under these circumstances, President Clinton's call to connect all schools to the Internet by the year 2000 is the only sign that the government may have finally begun to comprehend the significance of the digital revolution. Against this backdrop, we present below the policy recommendations that emerged from the colloquium.

Policy Recommendations

In thinking about policy recommendations, the colloquium participants acknowledged that, as described in Part I, the focus at the macro level is on a major economic transformation, whereas when we shift the focus to the micro or local level, as in Part II, we substitute models of education, community solidarity, and equity; as a result, economic issues at the local level do not receive much attention. As Leo Marx emphasized, policy prescriptions must take into account the changing nature of the economic

base of the country, involving redefinition of work and the consequences for full-time employment.

Bill Mitchell injected another cautionary note into our policy deliberations: IT is developing so rapidly that a public policy proposed today may quickly become obsolete as technological improvements open up new possibilities and close old options. With these two caveats in mind, we propose the following set of policy recommendations for capturing the immense potential of IT for low-income areas.

IT Is No Substitute for Social Policy

The universalistic, undifferentiated language that is used to describe global trends and transformations resulting from IT lends itself to the creation of myths. These include: the myth of technological utopianism in which technological change is seen as assuring social progress, benefiting everybody, and correcting the inequities in our society; and the myth of technological leapfrogging, for example, the belief that software entrepreneurship offers unlimited opportunities for the emergence of modern-day Horatio Algers among the persistently poor.

Such myths serve the interests of politicians who are eagerly, or reluctantly, involved in cutting back the federal safety net for the poor. It is no accident that Newt Gingrich, the Speaker of the House, entertained the idea of giving a laptop computer to every homeless person! These myths, however, also satisfy a deep-seated belief in the American psyche, a profound identification of technological change with social progress. We also note that, at the other end of the spectrum, the technology pessimism is equally mythical and equally unsupported by the evidence, if it is taken to mean that digital technology offers no significant opportunities for low-income people. The correct approach, we propose, is to adopt a nuanced view, rejecting both extremes.

The Poor Must Not Be Excluded from Shared Inquiry

To devise policies that would capture IT's benefits for the poor, we need to understand that poverty is not simply lack of adequate income. As the community activists reminded us, the poor are hurt most by a sense of

exclusion from the mainstream economy, society, and polity, and feel disempowered to improve their situation. This lack of a sense of effective citizenship adversely affects the poor's self-confidence and thus undermines their ability to learn from day-to-day experience. It also reinforces a sense of low self-worth, which, as Bruno Tardieu noted, causes the poor think they have no useful valid knowledge to offer. Consequently, IT reinforces for the poor the idea that machines know more than they do. Under these circumstances, the poor, even if provided access to IT, are unlikely to transform themselves from consumers to producers of knowledge.

The Government Must Ensure Universal Access

To ensure access, policymakers need to consider five elements: provision of infrastructure, affordable hardware, user-friendly software, the ability and motivation to use software, and periodic upgrading of hardware and software to keep pace with technological changes. Left to itself the market will not respond to all five needs. Furthermore, if these needs are not met, market-provided traditional services such as bank branches may be withdrawn from low-income areas.

Public policies to ensure access should be built on the premise that much of the prevailing telecommunications infrastructure has been developed by private firms, and the government needs to build off that infrastructure to provide universal coverage. To do so, the federal government should first provide incentives to private firms, but lacking results, the government should stipulate that private service providers must offer a certain minimum level of services to low-income areas. This is not a radical proposal: governments have pursued a similar approach for years to ensure the availability of adequate housing for low-income families by providing various incentives to real estate developers who otherwise would not build low-profit-yielding buildings. Similarly, many local authorities have required cable companies to provide facilities for local channels accessible to low-income consumers. The level of subsidies may vary from case to case, but the principle is the same: without government nudging, private firms are usually unwilling to provide services to low-profit areas. In the case of IT, however, the nature of government prodding must be somewhat differ-

ent than, say, in the provision of low-income housing. The government cannot subsidize the construction of infrastructure for universal service because this would require a large volume of resources that the government cannot muster for financial and political reasons. Instead, the government should strategize how to achieve universal coverage incrementally, encouraging technological innovations that can facilitate the convergence of telephone, cable, and computer technologies. Such convergences are likely to reduce the cost-of-service provision, which is key to ensuring universal coverage.

One Key Objective of Universal Coverage Is to Create Better and Equal Public Education for Children and Youth in Low-Income Areas

There was a consensus among the colloquium participants on this point. We also agreed that this objective cannot be achieved by local-level, voluntary support from private firms or wealthy philanthropists, even though some localities have managed to muster resources by relying solely on their generosity and good will. A second option is to raise property taxes. But, the property tax base in low-income areas is not adequate for this purpose. Moreover, low-income families may not be able and willing to pay higher taxes. Hence the initiative will have to come from either the state or federal government and may require some form of legislation, like the Community Reinvestment Act, which requires private businesses such as banks to reinvest a fraction of their profits to revitalize economically lagging communities.

Another possibility is for state governments to encourage partnerships between private firms and low-income communities. For example, in San Francisco a community technology fund was created in 1996 by Pacific Telesis and more than one hundred community organizations. The goal was to ensure that California's neediest residents will have access to telecommunication services after Pacific Telesis's merger with SBC Communications. Policymakers everywhere can learn from this example: they need to understand business trends within the telecommunication firms located in their areas and help these firms benefit from such trends on the condition that the firms would reinvest in low-income areas. This strategy

may serve the firms in more than one way: in addition to increasing their profits, it may provide them access to new markets. (Note the following comment by Phil Quigley, chairman of Pacific Telesis: "These are emerging markets of California, and we believe it makes good business sense to serve them."⁶)

Financial Strengthening of Public Schools Is a Necessary but Not Sufficient Condition for Innovative Use of IT for Educational Purposes

At present, public schools in low-income areas lack basic necessities, such as classroom space and books and other educational materials. If these basic needs are not met, the quality of education is not likely to improve—even if these schools are connected to the Internet. Moreover, initial resistance to using computers is likely, particularly if the teachers are untrained and cannot perceive the benefits of IT as a new educational technology.

The best way to introduce IT into public schools is to demonstrate to the teachers and administrators how IT can help them address some of the basic problems they have been confronting for years. For example, public schools in low-income areas usually suffer from a lack of parental participation. If IT could be used creatively to enhance parents' participation, it might be adopted by these schools. Similarly, teachers and administrators might adopt IT quickly if it can be shown to enhance the students' interest in learning science and mathematics.

As an educational technology, IT is most likely to be effective where educational computers play the role of mediators—bridging between the students' hands-on, bodily knowledge and the symbolic representations of knowledge usually favored in school. As Jeanne Bamberger documents in Part II, in a mediating role, the educational computer enables descriptions to function as commands—descriptions making themselves real—so that a student can perceive what her/his description does. Often the effect is one of surprise, leading the student to question and making it possible to arrive at a new understanding of the phenomenon.

Outside the classroom, the educational computer can be modified to become a "community" rather than a "personal" computer, operating as a holding environment for the local knowledge that neighborhood children may put into it. As Bruno Tardieu describes in Part II, the associative

memory of a community computer can lend itself to the retrieval of that knowledge, in an open-ended range of categories and combinations. In this context, the speed of a computer is not as important: in fact, the relative slowness of a plotter reveals more of its built-in mechanism of operations than a faster dot-matrix printer, thereby creating a better sense of transparency to those children who manipulate it.

Public Policies Should Target Prospective Entrepreneurs

Although it is not commonly acknowledged, low-income areas do not lack entrepreneurs who would like to start businesses to sell telecommunications-related goods and services. Some of these prospective entrepreneurs participated actively in our colloquium seeking information about new business opportunities. Unlike the community activists, the entrepreneurs are not principally interested in poverty alleviation, but, in the long run, they may be equally effective in reducing poverty by helping to connect their communities to the telecommunications infrastructure. But, as Alice Amsden and Jon Collins Clark noted, entrepreneurship cannot flourish by itself: it needs financing and a set of social networks. The government can provide assistance by creating quasi-public bodies that, in conjunction with banks and insurance companies, can generate capital and invest in start-up companies by local entrepreneurs. This is not a new proposition: banks that are regulated at both the state and federal level are already playing such a catalytic role in accordance with the Community Reinvestment Act. In comparison, insurance companies, which are regulated only at the state level, have not been very active in such efforts. It is time to encourage insurance companies—particularly companies providing health and car insurance—to invest in low-income areas, because residents in these areas pay relatively high premiums for these services. Similarly, governors and mayors should appeal to local colleges and universities to provide the budding entrepreneurs with opportunities to upgrade their technical knowledge. Through such opportunities, the entrepreneurs are also likely to create new social networks with individuals and institutions outside their communities of origin. The new networks will be a valuable source of social capital which, as Amsden and Clark argue, is as important as finance capital in the success of telecommunications firms.

Public Policies Must Ensure that the Computer Functions as a Repository of Information for Interactive Use by Grass-Roots Planners

As Joseph Ferreira describes in Part II, IT has opened up new possibilities for generating, processing, and storing fine-grained data, which can strengthen the state-society relationship by creating transparency, trust, and accountability on both sides. For example, the 1996 welfare reforms, which require welfare recipients to find employment, have created a new urgency for information on job openings, availability of rental housing, and access to public transportation. At the community level, the area residents are anxious to know how efforts at fiscal federalism are likely to affect resource allocation for low-income areas. On the government's side, too, there is a new urgency to know more about low-income area residents, so that the impact of welfare policy reforms can be monitored. Moreover, as the burden of responsibility is shifted from the federal to state and local levels to encourage devolution of power, there is a new need for fine-grained data at lower levels of government regarding demographic trends, land-use patterns, and so on.

Who should gather and disseminate these data was not a policy issue until very recently as IT reduced significantly the cost of data gathering, storing, and dissemination. The lower cost has created an incentive for private firms to provide these services. As a result, a debate is ongoing regarding the appropriate role of government in data generation and dissemination. Our position in this debate is the following: we acknowledge that, so far, the government has been efficient in collecting meteorological data, for example, but technological innovations in data collection or delivery do not usually emerge from government control of the process. We also acknowledge how certain types of information with large positive externalities may not be provided by private firms. This suggests that the government must be involved in gathering some basic information about all cities. Private firms may build on that basic information (which is expensive to collect and requires standardization that only the government can ensure) by collecting additional, detailed, disaggregated data that may be of interest to individuals, communities, or public institutions.

If the Federal Geographic Data Committee (FGDC) accepts this division of labor, what should the government do to ensure that the data

needs of low-income communities are met? To begin, someone has to identify what kind of data are important for the residents of low-income communities: for example, data on job openings; job-related training; the availability of various government programs designed specifically for urban, low-income areas; local area banks' lending practices; comparative insurance rates for cars, buildings, and health, and so on. More important than who should be collecting these data is, according to Joe Ferreira, the question of how these data are to be processed and stored, so that low-income households can access and utilize them easily for making informed judgments about jobs, investment, and spending plans—the kind of issues that are also important to suburban, middle-class families. Perhaps before the government decides to collect these data for equity reasons, it may be appropriate to inquire whether locally based entrepreneurs might want to respond to this market niche, even though the rate of return for providing this service may not be very high in the short run.

Even if local entrepreneurs respond to the communities' specialized data needs, government—particularly, local government—must gather some basic data not only about low-income communities but also about the entire city. In storing these data and making it available for use, government must make sure that the programs used are compatible with the programs used by low-income residents. Put another way: in storing information, government must not forget that even if universal coverage is achieved, the programs and computers used by upper- and lower-income residents may differ. This differential capacity to access and manipulate information between lower- and higher-income area residents is likely to continue because of the fast pace of technological innovation and the higher-income resident's greater ability to purchase new hardware and software. Hence governments must be willing to support the minimum threshold data needs of low-income communities, leaving the more advanced needs, perhaps, to private firms.

Another important issue is how low-income households should guard against the possible violation of one of their basic civil rights: privacy. As mentioned earlier, IT's rapid development has drastically reduced the cost of data collection and dissemination, thereby encouraging large-scale data gathering on virtually every aspect of the social, economic, and political lives of citizens. In some instances—such as data on medical

doctors' records—the benefits of this new capability are significant. But, as George Orwell warned long ago, a line must be drawn between public and private knowledge. The separation between the two spheres, private and public, are socially produced, and like other social decisions, this too is influenced not by poor citizens but by those relatively better off. As a result, inner-city residents searching for employment could face a situation where prospective employers or service providers may know more about their lives than necessary. With national concern rising over the crime rate, “deadbeat dads,” unwed mothers, “welfare queens,” abortion, and so on, a lucrative new market for data provision may flourish. In some instances this may lead to the violation of civil rights of citizens, unless the government takes a strong stand against such disclosure.

On a related issue, the federal government should monitor closely the impact of fine-grained data on household income and expenditures, which can now be collected and distributed cheaply. On one hand, officials can use this kind of rich data to fine-tune public policy, but, on the other hand, market institutions may use the same data to more precisely redline certain areas. This may be particularly true for the provision of telecommunication's infrastructure, which will be needed most by families who can least afford it—that is, the unemployed engaged in job searches, the aged and disabled needing special services, and other such groups. Vulnerable and needy citizens like these must be protected against redlining. The government's record to stop redlining in mortgage provision indicates that, although it is impossible to totally stop this practice, publicity of a few demonstrative cases may discourage it.

What's Next?

In one of the concluding sessions of the colloquium, some community participants returned to the questions that had sparked the colloquium in the first place. What are the likely impacts of IT on low-income areas? And what purpose might this marvelous technology serve? The community participants proposed that these questions should be set aside for future deliberations and that instead, we continue the dialogue between academia and activists along the following lines: given an intention to achieve a cer-

cain kind of benefit for low-income people, or to help them achieve a benefit for themselves, how might a variant of the multifaceted technology serve the purpose? This shift in the intellectual focus of inquiry was welcomed by the faculty participants from the Department of Urban Studies and Planning at MIT because it fits well with the department's intellectual style of practice-based learning, in contrast to broad-brush theorizing from "the top." This is not to say that broad-brush theorizing of the kind found in Part I of this book is not useful for policymaking purposes. That is useful, we acknowledge, but only when informed by a good understanding of the complexities at the ground level which the prototype projects discussed in Part II captured well.

The prototype projects were inspiring because they suggested ways in which low-income people and communities could benefit from the fruits of the informational economy—to achieve a kind of education better suited to the needs and potentials of inner-city children; to create within low-income communities a more democratic, decentralized capability to enter into dialogue with one another and with the representatives of local government; to build a more active, close-knit community of place, fostering a sense of inclusion, rather than exclusion, from the larger social world, and at the same time enabling a more effective kind of community organization.

The few prototypes we discussed at the colloquium did not generate replicable models of how to achieve these noble objectives. They only made us more aware of the challenges and opportunities policymakers are likely to face as they try to channel IT's benefits toward low-income communities. Also, because the number of prototypes were few, it seemed that the lessons learned were still sketchy, needing answers to a host of questions that are critical for large-scale replication of the prototype projects.

How might a much larger array of design prototypes develop? And how should they be structured to answer our questions? We discussed the merits of continuing the association of the kinds of people gathered around the colloquium table: designer-architects, who like to stretch out scenarios and build prototypes, deploying particular versions of information technology, initiating public, fairly small-scale ventures; social scien-

rists, who like to pursue empirically researchable questions; and action researchers who learn by monitoring innovations, exploring how design prototypes are used, what people make of them, and what new questions they raise.

Suggestions for new prototypes were not lacking: a storefront drop-in center for potential software entrepreneurs; a community service center that would specialize in computer-delivered social and commercial services; computer labs that would be introduced into schools and community centers in low-income neighborhoods; a computer resource center that would be placed in public space in a low-income housing project; new uses of digital networks, like the one developed by the Shaws, to facilitate community organization.

Each new prototype would have to be designed, and its design would be guided by principles that had been drawn from the discussion of existing prototypes:

- The question would appropriately be turned on its head. One would not ask "Here's the wonderful technology, what could you do with it?" but rather "What do we want to happen? How could the technology help us do that?"
- One would want to make the technology available to low-income people themselves, drawing on their local knowledge and creativity to enable them to design new prototypes of their own. At the extreme, as one participant asked, "Why not just invest in the infrastructure and see what people do?"
- But there would be a necessary addition: individuals with special knowledge of hardware, software, and applications would need to create learning communities together with low-income people. As Bruno Tardieu remarked, putting computers in the hands of poor kids (as with the community encyclopedia) led to the creation of a larger data bank shared by poor communities in different parts of the world—and one could then listen to them, learning from what they did with it.

The discussion of design prototypes gave rise to the idea of a large-scale experiment for making information technology available en masse in low-income communities. We would need design scenarios, action strategies, and action research that could influence policy and feed into longer-term planning for the use of information technology in low-

income communities. In the wake of such an experiment, both the low-income community and the technology would be transformed.

And as one of the community participants then suggested, "I'd like to see a future colloquium around projects that were started as a result of this coming together."

Notes

1. In September 1993, the Clinton administration announced an initiative to promote the development of a National Information Infrastructure (NII), "a seamless web of communications networks, computers, databases, and consumer electronics that will put vast amounts of information at users' fingertips. Development of the NII can help unleash an information revolution that will change forever the way people live, work, and interact with each other." (Information Infrastructure Task Force, *The National Information Infrastructure: Agenda for Action*, September 15, 1993. Washington DC: Department of Commerce, National Telecommunication and Information Administration.)

2. The Community Decency Act would have prohibited the dissemination of morally offensive material over the Net. This act was turned down by the U.S. Supreme Court as unconstitutional on June 26, 1997.

3. National Information Infrastructure Advisory Council produced two reports in 1996: *Kickstart Initiative: Connecting America's Communities to the Information Superhighway* and *A Nation of Opportunity: Realizing the Promise of the Information Superhighway*.

4. Kapor resigned from the NIIAC to protest what he saw as its hidden agenda.

5. The Net Day program, an initiative to bring private resources to the schools, combines technical support, equipment donations, and volunteer labor. Participating firms select a partner school to which it donates funds, labor, and administrative and technical support; the schools contribute by raising funds to buy materials and providing volunteer labor.

6. E-mail announcement by *Business Wise*, October 15, 1996, 02.