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Technology and Social Inclusion

Rethinking the Digital Divide

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Social Resources: Communities and Institutions

The importance of social relations in shaping access to technology has been a major theme of this book. In this chapter I deepen this discussion by focusing on the concepts, research, and practice related to the intersection of information and communication technology (ICT), community development, and institutional reform. An underpinning for this discussion is the notion of social capital.

Social Capital

The concept of social capital arose in the 1980s as a number of social scientists considered the role of interpersonal relations in human and social development (e.g., Bourdieu 1986; Coleman 1988). To many, it was clear that the long-existing concepts of human capital (individual skills, knowledge, and attitudes) and physical capital (financial assets) did not fully describe the developmental resources available to people and societies. Parallel to human capital and physical capital is a category of social relations and trust that has come to be called social capital. Woolcock (1998), for example, points to his discussions with rural villagers in India in defining the concept:

When asked to explain why such miserable conditions prevail in their village and what they think needs to be done to improve things, the villagers' answers are revealing. The main problems, they say, are that most people simply cannot be trusted, that local landlords exploit every opportunity to impose crushing rates of interest on loans, and pay wages so low that any personal advancement is rendered virtually impossible. There are schools and health clinics in the village, they lament, but teachers and doctors regularly fail to show up for work. Funds allocated to well-intentioned government programs are siphoned off by local

elites. Police torture innocent villagers suspected of smuggling. Husbands regularly beat or abandon their wives. Utter destitution is only a minor calamity away. You venture that surely everyone would all be better off if they worked together to begin addressing some of these basic concerns. “Perhaps,” they respond, “but any such efforts seem always to come to naught. Development workers are no different: just last month, someone who claimed to be from a reputable organization helped us start savings and credit groups, only to vanish, absconding with all our hard-earned money. Why should we trust you? Why should we trust anyone? (152–153)

In the eyes of social scientists, what this village lacks is social capital. Social capital can be defined as the capacity of individuals to accrue benefits by dint of their personal relationships and memberships in particular social networks and structures. For example, if a friend provides information about a possible job, that represents social capital. If a parent offers high educational expectations, opportunities, and support to a child, that represents social capital. If a government bureaucrat can be trusted to do what he or she says, that too is a form of social capital. Social capital accrues both to individuals and to communities, which benefit from the collective social capital in their midst. Even a poorly connected person benefits from living in a well-connected community; for example, if members of a community are known for keeping an eye on each others’ homes, that will discourage crime in the neighborhood and benefit even those residents who have few neighborhood ties.

Social capital is not just an input into human development but a “shift factor” affecting other inputs (Serageldin and Grootaert 2000, 54), because it tends to enhance the benefits of investment in human and physical capital (Putnam 1993). For example, investments in training can be multiplied by the inputs of social capital as the strengthening of social ties enables people to better learn from others.

An important source of social capital is the personal relations that people have in their family and community. These relations can provide information, influence, social credentials, and reinforcement (Lin 2001). Information can include everything from a recommended health care provider, to a tip for a job opening, to advice on preparation of soil. Influence is exerted on others, for example, when an associate persuades somebody to hire you. Social credentials refer to the higher regard that someone might have for you because of your social connections (e.g.,

your family, friends, neighborhood). Reinforcement refers to the emotional and personal support you get from people you know (e.g., encouragement in the face of illness). Norms refer to the general expectations of the groups around you; for example, a child benefits greatly if he or she attends a school where everybody is expected to attend college.

These benefits can be shared through bonding social capital and bridging social capital (Putnam 2000). Bonding social capital refers to the strong ties that are shared among dense, inward-looking social networks, such as among family members, close friends, church groups, or ethnic fraternal organizations. These strong ties provide the kind of emotional support that allows us to get by. Bonding social capital plays a dual role: it brings the strength of social solidarity but sometimes at the cost of antagonism with or distance from other groups (think, for example, of the strong bonding social capital in a youth gang, which might serve to alienate or isolate gang members from access to other social sources of information and support).

In contrast, bridging social capital refers to the ties that are formed with those from other social circles. Since it provides important links to new sources of information and support, bridging social capital is considered especially important for economic and social development. The value of bridging social capital is explained by Granovetter's (1973) theory of the strength of weak ties. Those in our own immediate circle—our strong ties—tend to have similar friends and similar sources of information to us. Therefore, when we bond with them, we may not gain much in terms of new sources of information or support. However, distant acquaintances and contacts will have access to different people, different information, and different social networks. Therefore, a broad network of weak ties is actually more important than a small network of strong ties in many ways. For example, distant, weak social ties may be more useful than strong, close ties in finding a job or gaining political allies. As Xavier de Souza Briggs puts it, strong ties are good for “getting by,” while weak ties are crucial for “getting ahead” (quoted in Putnam 1993, 21).

Other sources of social capital are the norms, rules, and expectations that exist in a neighborhood, community, or society. If men are expected to treat women well, individual men, women, and children will all

benefit. If drivers are expected to stay in their own road lane and signal before turning, each driver will benefit because of the increased safety—or at the very least, predictability—of one's own and others' driving. If government officials must follow rules that restrict opportunities for corruption, the entire society will benefit. Of course *relational* social capital (based on bonding and bridging) affects *norm* social capital (based on norms and expectations), and vice versa. The types of bonds and bridges that exist between individuals, the types of groups and organizations that people belong to, and the way that these groups express the needs and desires of a community all affect and are affected by the norms and expectations of a society.

The Internet and Social Capital

What, then, is the relationship between the Internet and social capital? On the one hand, social capital is an important factor in gaining access to computers and the Internet. Entering the world of computing is quite complex. It involves making decisions about whether to buy a computer, what kind of computer to buy, how to set it up, what kind of software to get, how to install it, how to obtain and set up Internet access, and then how to use the computer, the software, and the Internet. Most people rely on their social networks to offer support and assistance in this. That might involve anything from observing computer use at a friend's house, hearing how a neighbor uses the Internet, asking a colleague to help solve a software problem, or simply buying a computer for your child because it is a general expectation in your community that children should have access to computers (see Agre 1997).

For people whose social network does not include computer users, the challenges of purchasing, setting up, and learning to use a computer can be overwhelming. Two recent studies conducted in California provide evidence of the value of social capital in gaining entry to the world of computing. The first study, based on a survey of 1,000 people, found that social contact with other computer users was a key factor correlated with computer access (SDRTA 2001). As the study reports,

Although most respondents stated that they know people who used computers, the digitally detached (those who do not have home personal computers, Inter-

net access, or access to the Internet outside of the home) did not. And when compared with the impact of ethnicity, income, and education level, this sentiment—that they did not know others who used computers—is far more significant. (12)

The second study, based on interviews at community technology centers, found that the social support offered at those centers was critical to many people's decisions to purchase computers (Stanley 2001). In many other cases, though people already had purchased computers, they were not yet using them but began to use them after engaging in computer use in a supportive social environment offered by their local community technology center.

Neither of these studies proves that a particular type of social support promotes computer access; they do, however, show that social networks and computer usage are inextricably linked. Community initiatives can take advantage of this linkage to facilitate home computing. For example, one neighborhood project in Massachusetts—in spite of offering a package including free home computers, free Internet access, and free training—was only able to sign up 8 of 47 families in a neighborhood housing project. However, after residents from the housing project who had already participated in the first round of the project went door-to-door and spoke of the personal benefits that they had received, the registration rate jumped from 17% to 57%.¹ Similarly, a “learn-and-earn” project in Riverside, which allowed people to purchase computers at a discounted price if they had first completed a computer course at a training center, found that the personal contacts established at the training center were critical to people's use of their new home computers. It was not only the training and skills the center provided but also the network of support; the new computer owners would return frequently to the center to consult with staff members about hardware, software, and other issues related to computer and Internet use.²

The larger question is not whether social capital provides support for using the Internet but whether using the Internet extends people's social capital. The natural assumption is that the answer is yes, because the Internet provides expanded opportunities for communication and association with broad numbers of people. This is especially important for developing weak social ties, for which the Internet is a natural medium. As Collier (1998) explains, one of the simplest ways to promote social

capital is to lower the cost of social interaction, and the Internet certainly achieves that. One leading sociologist has gone so far as to proclaim that the rise of the Internet has brought about “a revolutionary growth of social capital” (Lin 2001, 237).

Empirical studies do suggest that the Internet can promote social capital. An in-depth study was conducted by Keith Hampton, who carried out his dissertation research in a suburban housing community in Toronto known as Netville (Hampton 2001a). All those purchasing homes in Netville were offered free broadband Internet access, but in the end this access was provided to only 60% of the residents. The resulting dichotomy between those with and without Internet access—two groups that were highly similar in most other ways—provided a fertile laboratory for analyzing the impact of Internet use on social capital. The study found that those with Internet access maintained and developed more extensive social networks of contact and support both within Netville and outside (Hampton and Wellman 2001). Outside the community, the wired residents tended to maintain or increase their contacts and support from people who lived less than 50 kilometers away, between 50 and 500 kilometers, or more than 500 kilometers, whereas the unwired residents faced decreased contact or support at all three distances (presumably because they had just moved to a new neighborhood and thus were removed from old contacts and busy getting moved in to their new homes). Interestingly, the greatest differences in support rendered to wired and nonwired residents was from people at an intermediate distance (50–500 km), suggesting that the Internet is especially helpful at building social capital with those people who are “just out of reach” (more so than with those whom one never sees, or sees often).

As for contacts *within* the Netville neighborhood, those were also (Hampton 2000; 2001b) bolstered by online communication. This was due not only to Internet connectivity but also to the use of a community e-mail list known as Net-l. Because of communication on this list and the social ties that arose from exchanges online and later offline, wired residents had substantially more contact of every sort within the community than did nonwired residents, whether measured by number of people recognized by name, number of people talked with on a regular basis, number of people called on the phone, or number of people visited

at home. Interestingly, the wired residents even had more contact with the nonwired residents than the latter group had among themselves, apparently because the wired residents took responsibility for sharing and passing on information from the Net-1 list to their nonwired neighbors.

However, there are countervailing factors involved in any consideration of social capital and ICT use, including several reasons why the Internet might *not* promote social capital (see Putnam 2000). First, as discussed in chapter 5, face-to-face interaction provides a richer form of communication and support than does online interaction. To the extent that online communication *supplants* rather than *supplements* face-to-face interaction, it could thus weaken social capital. Think, for example, of a school class that carries out an international exchange with students in another country while missing opportunities to interact more directly with different social or ethnic groups in its own city. At least one study claims to show that the more time people spend online a week, the more they lose contact with their social environment (Nie and Erbring 2000).³

This potentially negative effect on social capital could be exacerbated by the amount of hostility that occurs online. The reduced communicative content (no visual or auditory clues) frees people up from their inhibitions online, which allows easy contact with large numbers of people but also can bring out the worst in people. This results in a phenomenon called flaming, in which people express hostility in ways they might never do face-to-face.

The Internet can also lead to a narrowing of social contact rather than a broadening. A teenager is just as likely to spend hours online chatting with a small circle of friends as he or she is to form new contacts and bridges with diverse social networks. Those who use the Internet to seek information may also have their sources narrowed rather than broadened (see Sunstein 2001). The Internet continues a trend of narrowcasting that began with the proliferation of radio stations and television channels. On the Internet, you can design “*my CNN*” or “*my Yahoo*,” thus making it less likely that you would discover the new sources of information that you might come across in reading the newspaper or browsing a library shelf.

Finally, there is no assurance that people will use the Internet for either social interaction or information. The most popular and fastest growing uses of the Internet include private, antisocial forms of entertainment, such as viewing pornographic material and gambling. To the extent that the Internet facilitates activities such as these, it will weaken rather than strengthen social capital.

While some cyber-pessimists have sounded the alarm about these potential drawbacks of the Internet, most sociologists take a more balanced view. The associative power of the Internet can be exploited to supplement social capital, but not if the Internet is seen as the be-all and end-all. Rather, strategies must be devised to combine the strengths of the Internet with other forms of interaction. This is especially important when working with impoverished or marginalized groups that need to leverage *all* their sources of capital in order to thrive.

How can this be accomplished? Efforts to make use of ICT to promote social capital take place at three different, albeit overlapping, levels.⁴ One is the microlevel, referring to the relations with friends, relatives, neighbors, and colleagues who provide companionship, emotional support, goods and services, information, a sense of belonging, and opportunities for community development. A second is the macrolevel, which corresponds to the effectiveness of governmental institutions and transparent and trustworthy relationships that exist between governments and citizens. A third level, falling between these two, is the mesolevel, corresponding to the voluntary associations and political organizations that allow people opportunities to form alliances, create joint accomplishments, and collectively defend their interests.

Microlevel Social Capital: Virtual Community vs. Community Informatics

There are two approaches to using the Internet to promote microlevel social capital. The first can be called the virtual community approach, and the second, community informatics.

Virtual Community

The term *virtual community* was popularized by Howard Rheingold in 1993 with the publication of *The Virtual Community: Homesteading on*

the Electronic Frontier. Rheingold had been active in computer conferencing since the mid-1980s, and he wrote eloquently of people's experiences in a pioneer computer conference called the WELL (Whole Earth 'Lectronic Link). The WELL's members, mostly upper-middle-class suburbanites in the San Francisco bay area, participated in a wide range of electronic forums such as Arts and Letters (the Beatles, Jazz); Recreation (Gardening, Chess); Entertainment (Star Trek, Bay Area Tonight); Education and Planning (Biosphere II, Transportation), Computers (Software Support, Desktop Publishing), and Body-Mind-Health (Recovery, Gay Issues). Rheingold provides a compelling narrative of how a group of strangers from different backgrounds and places came together electronically to share information, debate and discuss ideas, and provide emotional support in time of need.

However, Rheingold later came under broad criticism for his overenthusiastic reliance on anecdotal evidence, his neglect of countervailing patterns, and his apparent support for the notion that online communities were distinct from, and perhaps better than, traditional ones. To be fair, he never claimed to be carrying out academic research, and his views on the existence of an autonomous cyberspace and virtual communities were never as extreme as those of others, such as cyber guru John Perry Barlow of the Electronic Frontier Foundation, who argues that cyberspace constitutes an entirely different world (Barlow 1996).

Eventually, Rheingold himself came to moderate his views, partly because of his participation in bitter social conflicts that emerged in and around the WELL. In the revised edition of his book (2000), he questions the very notion of virtual communities as distinct from traditional communities. His critique rests on two key points. First, any technology emerges from and responds to existing social relations and social contexts. Technologies may create new possibilities, but they do not in themselves represent separate worlds. Second, and related to the first point, the division between virtual and traditional communities is spurious. As social network theory and research make clear (e.g., Wellman et al. 2001), so-called traditional communities are rarely based on neighborhood or village alone. In all but the most isolated parts of the world, people's social networks include relatives, friends, and other associates who live elsewhere, and contact with them is maintained through personal visits, mail, telephone, or other media. Thus the notion

of neighborhood-based traditional communities is outmoded to begin with.

Extensive research in a variety of domains indicates that the use of ICT tends to complement rather than replace other means of networking (Hampton and Wellman 1999; Warschauer 1999; Wellman et al. 2001). One of the best discussions of this issue is Philip Agre's (2001b) primer for graduate students, "Networking on the Network." Agre explains how students can make use of the Internet to steadily increase their contacts and positioning within academia, but only through building on other kinds of institutional relations already existing in academia, such as personal contacts between students and professors at universities and conferences.

Because of the intersection between online communication and other means of social networking—and because of the limitations of online interaction discussed earlier—approaches to promoting social inclusion that rely solely on virtual communities are ill-advised (see, for example, the discussion on distance education in chapter 5). Successful approaches usually combine online and face-to-face networking. An example of this is a group of Egyptian educators who have successfully come together (outside Ministry of Education channels) to learn about educational technology and its integration into their classrooms and lives. The group thrives through an e-mail discussion list, but this list was only formed after several face-to-face meetings in Cairo to share ideas and discuss plans. The group still holds occasional face-to-face meetings to conduct training sessions, hear guest speakers, or simply socialize. Annual technology fairs are planned for national conferences. Through a combination of face-to-face training, committees, projects *and* e-mail discussion, the group has developed into a strong educational support network—far stronger than it could have become through Internet contact alone.

Community Informatics

If the virtual community concept provides a poor frame of reference for thinking about technology for social inclusion, a better framework is provided by community informatics (see Gurstein 2000; Loader et al. 2001). Community informatics seeks to apply ICT to help achieve the social, economic, political, or cultural goals of communities. Commu-

nity informatics begins from the perspective that ICT can provide a set of resources and tools that individuals and communities can use, initially to provide access to information management and processing and eventually to help individuals and communities pursue goals in local economic development, cultural affairs, civic activism, and community-based initiatives (Gurstein 2000). Community informatics strives to take into account the design of the social system and culture within which the technology resides as well as the design of the broader technological system within which a particular tool or medium interacts.

Promoting social capital is a key strategy of community informatics, but this is not seen as taking place principally through online communication. Rather, social capital is created and leveraged by building the strongest possible coalitions and networks in support of the community's goals, using technology projects as a focal point and organizing tool. Online communication is of course part of this, but so are more traditional forms of communication, organization, mobilization, and coalition building.

My research in a variety of settings has indicated that five strategies are critical to promoting social capital in community technology projects. These include leveraging existing community resources, mapping and connecting existing community connections, integrating with broader social and economic campaigns, organizing new social alliances, and social mobilization via a wide range of media and tools.

Leveraging Community Resources Probably the most effective method for leveraging community resources is to work through existing community organizations or leaders to launch and manage community technology initiatives. Community organizations know the local situation and can work to provide a structure that meets local needs. One of the main failings of the Hole-in-the-Wall computer kiosks in New Delhi discussed in the introduction to this book was that no local community organization was involved in running them. The director of the project, a government official, told me that he preferred to work “directly with the people” rather than via intermediaries such as community organizations.⁵ However, in this case, going “directly to the people” meant placing a project in a community without any organized way for the

community to partake in the management or leadership of the project. In contrast, the best community projects I have witnessed in India, Brazil, and elsewhere make ample use of community resources. In India, for example, where many local villages are led by local tribal leaders, their participation is critical in the effective implementation and management of community technology projects. In the cities of Brazil, in contrast, key community roles are played by neighborhood associations, slum-dweller groups, and other nongovernmental associations.

Many times, a single community group can be brought in directly to manage a project. In other cases, leaders of several community organizations can come together to form a new community council for the project. So while the Hole-in-the-Wall project suffered from an unclear purpose and questionable sustainability because of its lack of community leadership, another street children's project in India—a computer-based training program—was run very effectively by a nongovernmental organization called Prayas, which has a long history working with street children in many other capacities (e.g., through housing programs, health clinics, counseling services). Since this group already has worked with street children, knows their needs, and has their trust, it was able to fashion a computer training program that had a better organization (through structured classes) and purpose (vocational training) than merely placing computers in a slum.

Another strategy for leveraging community resources is through the promotion of ICT capabilities of extant groups. An example of this is the Community Digital Initiative, a community technology center in Riverside, California, a city with a large number of low-income Latinos.⁶ Though the center also runs individual training programs, much of its impact comes from work with organizations. The project chose as its location a large building in the center of town that hosts many other community organizations, including violence prevention groups, a dispute mediation group, a volunteer center, court referral programs, housing programs, transportation access programs, crisis intervention programs, community health projects, and legal aid organizations. These groups, as well as similar organizations elsewhere in Riverside, form an important part of the clientele of the center. Managers, administrators, and members of these groups participate in workshops to learn how to

use computers and the Internet to function more effectively. This might include everything from developing a computerized mailing list, keeping track of organizational finances, developing brochures and newsletters, making an organizational Web site, or setting up an internal or external e-mail list. The center also provides its equipment and resources for the community organizations to carry out these tasks. In this way, the efforts of the Community Digital Initiative are multiplied as existing community groups are empowered to carry out their organizing more effectively.

Mapping and Connecting Community Resources Mapping community resources is a critical component of launching a successful community technology initiative. Participatory rapid appraisal (PRA) techniques (see chapter 4) can be used to identify relations and resources within a community and how those might be amplified through a technology initiative. For example, one of the PRA techniques used in rural telecenter planning in India is community mapping. Different members of the community are invited to draw maps of the community from their own perspective. By seeing how different members map the community, organizers can learn about which locations, people, and assets of the community are most valued, and which location, for example, might be the best for placing a community telecenter. Other PRA techniques include identifying who is in contact with whom. For example, another rural Indian telecommunications project learned through PRA techniques that women in the village tended to communicate principally with other women rather than with men. The project then incorporated the rule that half the staff of its village knowledge centers should be women, to ensure that everyone in the village would be able to have a voice and be heard.⁷

As discussed in chapter 4, the community can later be drawn into developing more detailed databases of local resources and assets. For example, the Sampa.org project in São Paulo has mobilized a group of people to develop a geo reference system of the Capo Redondo *favela*, including a physical map of the streets and a database of community resources such as health centers, neighborhood associations, and worker cooperatives. Whereas this kind of information is easier to find

in wealthier communities, many of the *favelas* of Brazil are like informational black holes. In this case, a commercial transportation company, which monitors deliveries in the area but has no existing map, funded the project. From the community organizers' point of view, the project serves multiple ends. Not only will the database itself be of great use to community members when made available through the local telecenters in the Sampa.org project, but the mapping team is gaining important vocational skills (e.g., development of geo reference systems) that they can then market to others.

Integrating with Broader Social and Economic Campaigns Technology projects do not exist as ends in themselves. They are most effective when they are tied to broader social and economic campaigns, as seen by the following three examples.

Bresee Cyberhood The Bresee Foundation has been carrying out community organizing in central Los Angeles since the mid-1980s.⁸ The neighborhood in which it organizes is one of the poorest and most crime-infested neighborhoods in Los Angeles, with high rates of homicide, gang-related shootings, auto theft, domestic violence, and drugs, and low rates of employment, income, and health care. More than 40% of the people in the neighborhood live below the poverty line and some 54% lack health insurance. The neighborhood was also the site of the infamous Rampart police scandal, in which members of the Los Angeles Police Department were convicted of planting evidence, faking confrontations, and repeatedly lying to send men to prison.

Bresee's community development strategy is largely built around forging social capital in the neighborhood. This is accomplished via a community center that provides a safe, trusting environment through a wide array of programs. The center includes a health clinic, a homework assistance program, a recreation program, youth discussion groups, and employment training. Recently, Bresee opened a computer center, known as Cyberhood, within the broader community project. Cyberhood offers a wide range of services, including open drop-in computer and Internet access for adults, a range of computer courses, a multimedia internship program for teenagers, and technology-and-employment programs.

The integration of Cyberhood into the broader social development mission of Bresee offers many benefits. For one, Cyberhood builds on the safe and trusting atmosphere of its parent center. Among the Cyberhood participants I interviewed was a local homeless youth who came to the Bresee center regularly because it offered a safe environment for him to spend time in. Also, the computer projects can benefit from the broader organizing campaigns and relationships of Bresee. Bresee's relations with local schools, universities, and businesses, for example, help to recruit the right children into its technology programs and to provide them with sufficient volunteer support. In addition, there is much crossover between the different services. Some of the people who attend the health clinic at the center later come to Cyberhood to find information on the Internet related to their health needs.

One strategy for community building is through fostering local leaders. Some 25% of the employees at Bresee were formerly clients of the center. Local youth leaders are constantly developed through training and internship. For example, in the computer center, much of the hands-on assistance is done by teenagers who have completed a course there and who have demonstrated talent; they are subsequently hired to help others.

The Cyberhood programs also serve the economic goals of Bresee, through integration of technology and employment training. Courses focus on graphic business design skills, such as the development of business cards, brochures, and newsletters. Other software programs are used to help the youth develop an overall sense of direction in their lives. For example, a software program called Choices helps people research the kinds of careers they might be interested in and the types of preparation those careers require.⁹

In summary, Cyberhood is not an end in itself. As the director of Bresee explained to me,

We don't just teach people computers, it's not just about developing skills—it's about connections with people and building relations. This community lacks the kind of mediating institutions like good schools, churches, and parents involved in the schooling. Our technology programs work together with all our other programs to help people develop these kinds of relations that are often missing. In this way we can be a gathering place and hub for the community.¹⁰

M. S. Swaminathan Research Foundation A rural counterpart of Bresee is M. S. Swaminathan Research Foundation (MSSRF) in southern India.¹¹ MSSRF has been carrying out economic and environmental programs in communities in Pondicherry and Tamil Nadu since 1991. MSSRF works with the neediest groups in order to simultaneously combat rural poverty and environmental degradation. Its strategy in rural India is to help landless laborers and small farmers develop the skills, resources, and organization they need in order to obtain much greater value from their labor. As a centerpiece to this, they have developed two model biovillages, where agricultural laborers can come to observe environmentally sustainable farming processes firsthand and learn new skills, techniques, and information. Projects at the biovillages focus on aquaculture, mushroom and flower cultivation, fodder cultivation, horticulture, conservation of rainwater, composting, rope-making from coconuts, pest control, and dairy farming.

MSSRF later developed village knowledge centers, a network of computer kiosks in rural villages, to serve this broader socioeconomic development project. Content from the biovillage projects is made available throughout an intranet that connects the centers. Even if the farmers themselves can't read it, the center staff can share information about bio-farming with them. With funding from the Commonwealth of Learning, a local farmers' group is further developing this content into databases to assist rural development campaigns throughout India. In addition, MSSRF is helping women's collectives learn computer skills needed for microfinance management, so that they can better work to obtain and manage their bank credit in carrying out sustainable agriculture projects.

One of the more exciting offshoots of this program is Oddanchatram-market.com, an e-commerce Web site and campaign started by a local farmers' association. In order to enhance demand—farms in the area lay fallow 40% of the year because of lack of a market for the goods—the local small farmers' association went to the suppliers and offered to announce their goods on a Web site. The intention is to increase national demand for local products, thus providing greater income for suppliers, farmers, and agricultural laborers alike. The suppliers will pay a nominal fee for the service, thus providing additional funds for the farmers' association.

ISIS for the Blind and Visually Impaired The Information, Service, Integration, and Schooling (ISIS) project for the blind and visually impaired is located in Graz, Austria.¹² ISIS, whose president and staff are themselves all blind or visually impaired, seeks to open job possibilities beyond classical blind employment (e.g., basket weaving) to more wide-ranging opportunities in the information economy. Toward that end, ISIS has set up a computer training center offering courses for the blind, ranging from an introductory module leading to a European Computer Driving License¹³ to specialized topics like the Linux operating system, with an orientation toward labor market needs. The training center also hosts what is believed to be the first public Internet café for blind people, where people are offered the opportunity to browse the Internet using specially designed hardware and software as well as to interact with other café visitors. In addition, a telephone “blind line” provides free information to the blind and their relatives, educational establishments, and social service agencies about assistive technology issues and training opportunities.

Organizing New Social Alliances While the virtual community approach focuses on developing online ties, the community informatics approach seeks to actively engage an array of groups in social projects. In this way, the community gains access to social contacts and support from diverse resources that may not have been accessible before. For example, Alkalimat and Williams (2001) describe how gradually increasing the involvement of local churches, a university, and municipal organizations provides strength and sustenance to a community technology center. Similarly, in Egypt, the 21st Century Clubs are a national set of computer centers that have been developed through an alliance of nongovernmental organizations (which run the centers), private businesses (which donate the computers), software companies (which provide office and edutainment packages), and the governmental Ministry of Information Technology (which coordinates the project).

The Riverside Cybrary in California is an example of an initiative that helps develop social capital, in part through strengthening community-university relations. The Cybrary was initiated by the Riverside Public Library. It is located in a storefront in a low-income Latino community

and provides a friendly, accessible atmosphere for neighborhood youth. Children and teenagers drop in to use the computers in the library, all of which are connected to the Internet, and are offered individual instruction and support from local volunteers. Most of the volunteers come from special service learning projects run by local universities. The volunteers not only provide invaluable computer support but also act as role models for the teenagers, many of whom have never met anybody who has attended college. Since many of the volunteers are themselves Latinos, they can relate well to the children and answer their questions not only about computers but also about college and possible career paths.

In regard to outside support, it is important to bear in mind that no group participates in a community project without its own interests in mind. For example, many community technology projects are aided by businesses that donate hardware or software or provide community volunteers, and one of the largest such supporters is Microsoft Corporation. This support often comes in the form of donations of Microsoft software. While free software is valued by projects, these donations also benefit Microsoft in that they commit projects to a Windows platform and showcase Microsoft products to potential future customers. In addition, community organizations are much less likely to pursue using free software solutions, such as those based on Linux, if commercial operating systems and office suites are offered free.

Social Mobilization through a Variety of Media Another important strategy for community technology development is to use all available media to amplify the power of the Internet. This is especially important in developing countries, where individual use of the Internet is not widespread. Examples of this principle are three projects in South Asia.

The Kothmale Community Radio Internet project in Sri Lanka makes use of FM broadcasting to bring online information to thousands of people without Internet access.¹⁴ Kothmale is located in an underdeveloped area of Sri Lanka, several hours from the capital. The radio station was set up in 1989 to serve the needs of the rural and small-town population, numbering close to 350,000 people in a twenty-five-mile radius. An Internet component to the project was launched in 1998 with

a grant from UNESCO. The Kothmale radio announcers gather information from the Internet, which they incorporate into news, weather, journalism, and music programs. The announcers also take questions from listeners delivered by postal mail, research the questions on the Internet, and provide answers on the air in local languages. The questions are answered on radio programs focusing on topics such as human rights, the status of women, rural health, farming, and international events. The questions are often very specific to the needs of the community, such as the care of a local tropical disease or the best way to raise and market geese. The announcers also visit the rural villages themselves to get local content for their broadcasts as well as to gather more questions from the community. Finally, to provide greater Internet access, the radio station has opened up its own facilities for community Internet use and has also built two more community technology centers in the area.

The M. S. Swaminathan project, mentioned earlier, makes very creative use of multimedia in one of the village knowledge centers located in a fishing village. The project staff members download information on weather and sea conditions daily from the U.S.-based Cable News Network and U.S. Naval Station Web sites. They translate the information into the local Tamil language and broadcast it over a loudspeaker from the community technology center. The village fisherman can easily hear the broadcast from the beach 100 meters away, and they use the information to improve both their safety and productivity. Information is also posted on blackboards and bulletin boards outside the center for those who might walk by.

Finally, the Gyandoot rural technology project in Dhar makes use of a wide variety of media and campaigns to build involvement in the project while focusing attention on local health and economic concerns. One of its annual campaigns is a "healthiest child competition," in which parents throughout the rural area are invited to bring their children to the local village Internet kiosk. Radio and newspaper announcements, posters, and even local theater boards are used to promote the competition. Volunteer medical personnel come to the Internet centers to weigh the children, check their vaccination records, and otherwise perform examinations. The campaign serves to introduce the rural populace to the Internet kiosks while also calling attention to important health needs,

such as vaccinating children. A similar campaign was later organized for the “most productive cow,” based on milk yields and promoting knowledge of dairy farming techniques.

In summary, all the examples discussed in this section use technology as an additional tool to promote social capital and community development, and none of them focus on technology as an end in itself. Information from the Internet is used to enhance this process, but it is often downloaded and shared via a variety of media rather than expecting individual use by community members.

Computer-mediated communication can be an element of community informatics, but it is not the only or even the principal form of communication. Rather, as Resnick (2002) suggests, it is more likely that an Internet-based communications system can be used effectively for community development only after its users have developed, through other means, trust in each other, a shared identity, or some other form of social capital.

Macrolevel Social Capital: Governance and Democracy

If microlevel social capital comes from the bottom up, macrolevel social capital comes from the top down. It concerns how the social structures of large institutions, especially governments, provide and facilitate resources and support to individuals and society. In this section I examine issues of governance and democracy, and their relationship to technology and social inclusion.

As Woolcock (1998) explains, an important component of macrolevel social capital is synergy, in other words, congruent and positive relations between the state and society. Woolcock cites India as a prime example of a country that, although democratic politically, and with a well-educated and highly prestigious civil service, still suffers from a severe lack of synergy. In India and other “weak” states,

The government may be committed in principle to upholding common law and may refrain from actively plundering the common weal, but in practice misappropriates scarce resources, is largely indifferent to the plight of vulnerable groups (women, the elderly, poor, and disabled), produces shoddy goods, responds slowly if at all to citizen demands, and is notoriously inept in supporting businesses seeking to be competitive in world markets. (177–178)

This lack of synergy worsens divides in India and other low-income countries in two ways. First, it holds down national development and keeps these countries poor vis-à-vis the West. Second, it serves to maintain and increase inequality within the country because the most marginalized and vulnerable members of society suffer the most from lack of governmental support.

Developing synergy is a challenging task, especially in countries with high degrees of inequality. A vicious circle often develops, in which the marginalization of the poor (through lack of literacy, social isolation, lack of access to media) puts them at a distance from government officials, governmental information, and governmental programs. This lack of access to governmental resources serves to increase their poverty and marginalization, which in turn further weakens their access to governmental assistance.

Well-designed use of ICT can help break this pattern and replace it with a virtuous circle of increased access to governmental information and resources, less marginalization, and further increased access. For this to take place, e-governance programs have to be carefully designed with the needs of the poor and marginalized in mind; otherwise, such programs will likely only benefit those who are already well connected. E-governance initiatives can help the poor in at least two ways. First, they can make government *transparent*. Second, they can help facilitate *citizen feedback*. I discuss initiatives in each of these areas using examples from India.

Transparency

In a typical developing country, gaining access to even the most common types of governmental information or documents can be a nightmare. Obtaining a simple governmental record can involve one or more overnight bus trips to the state or national capital; waiting in long lines in hot, overcrowded, and poorly organized government buildings; shuffling back and forth between a host of departments; and, too often, paying a hefty bribe to eventually get the document needed. And whereas the well-to-do often assign their servants to carry out such tasks, the poor have no choice but to carry out such tasks themselves, losing a good chunk of their meager income on transportation, lost wages, and bribes.

In many cases, the obstacles are so overwhelming that the poor don't bother even to try seeking their rightful information or documentation, and over time the lack of information and documents serves to worsen people's economic and social marginalization.

Developing transparent information and documentation systems is no easy task, especially given the low wages of government employees in most developing countries. Those who would be most responsible for implementing more transparent systems have little incentive to do so because that would lessen the possibilities for bribes and thus decrease their own incomes. It thus becomes almost impossible to achieve transparency through moral appeals to individual employees or units to improve the quality of their work. Rather, systemic solutions must be developed at a broader and more comprehensive level. The use of ICT to systematize the maintenance and distribution of governmental information and documentation provides one possible mechanism for achieving transparency, especially when combined with efforts to make sure that the marginalized have equal access to this computerized information.

The lack of systematic and transparent recording and public documentation of governmental data is a major issue affecting international development. Probably the most important example of this is in land records. Hernando de Soto (2000), an internationally renowned economist and president of the Institute for Liberty and Democracy in Peru, has published an exhaustive and compelling study of the importance of land records for international development. De Soto explains that, unlike the West, where transparent documentation of land ownership allows people to use their property as a source of capital, much of the developing world lacks such documentation, with a devastating effect. He writes,

In every country we researched, we found that some 80% of land parcels were not protected by up-to-date records or held by legally accountable owners. Nobody can identify who owns what, addresses cannot be easily verified, people cannot be made to pay their debts, resources cannot conveniently be turned into money, ownership cannot be divided into shares, descriptions of assets are not standardized and cannot be easily compared, and the rules that govern property vary from neighborhood to neighborhood or even from street to street. (Quoted in Binns 2001, 2)

According to his research, the total value of the real estate held but not “legally” owned by the poor of developing countries and former communist nations is equal to some 9.3 trillion USD. In most such countries the value of this extralegal real estate is many times greater than total savings and time deposits in commercial banks, the value of companies registered in local stock exchanges, all foreign direct investment, and all privatized public enterprises. If even a small portion of this amount of capital were unleashed, it could present an enormous reservoir for economic development and poverty alleviation.

India provides an excellent example of both the importance of land records and the difficulty of obtaining them.¹⁵ Government land records in India contain an exhaustive amount of information, including a delineation of the property borders, a list of crops grown, a description of crop output, a list of the cultivators and tenants, and a report on any outstanding agricultural loans from government agencies. Copies of land records are required for a wide variety of transactions, including long-term land mortgages, short-term crop loans, and applications for government poverty alleviation programs (e.g., to demonstrate that the person is a small farmer), and are even used in criminal proceedings (e.g., to give assurance that the accused is a landowner and thus has geographical roots and economic means). Since these records are frequently updated, simply having one permanent copy is not sufficient. Rather, people need to go to government offices to get an up-to-date copy of the land record on most of the occasions that they need to show it.

There are hundreds of millions of these land records in India. Until recently, they had all been kept on paper, much of which is yellowed, badly faded, or torn. These records are maintained by tens of thousands of local village accountants, who are responsible for recording updated information and also for distributing copies of the land records upon request from citizens. Both aspects of this process—the recording of information and the distribution of copies—are subject to a great deal of corruption. In a paper-based system it is easy for accountants to claim that a record has been misplaced, and thus to make the farmer come back again and again to receive a copy. On other occasions, information on the land record is illegible, thus requiring another bribe for the accountant’s clarification or correction. Similarly, when a sale is made,

the accountant can delay recording the transaction until the new owner has paid a bribe. Finally, village accountants, who have many functions in the three or four villages they are responsible for and yet who are often out of the office, can simply ask for a bribe merely to show up to meet someone. My own interviews with small farmers throughout India indicated that bribes for land records are the norm rather than the exception and that these payments can add up to as much as a small farmer's monthly income.

In response to this situation, the state government of Karnataka, India, implemented an ambitious computerization system of land record maintenance and distribution. The project was designed not only to move from paper to computer but to move from an informal, unregulated system to a transparent, efficient one. As a first step, local governments throughout Karnataka digitized the information on all twenty million land records in the state. At the time of digitization, landowners were given an opportunity to examine the computerized record to ensure that it was correct. After computerization, land records could be updated by village accountants via computer, and only after they gained access to the system through fingerprint identification. This guaranteed that changes and updates would not be lost and that an accountant could not deny that he or she had made a change.

The computerized system allows government auditors to easily verify if all land sales have been properly recorded within the mandated thirty-day period. When people need copies of land records, they are now generated and printed out by machine. The distribution process has been taken out of the hands of village accountants (some 9,000 in the state) and shifted to a single person and machine in each subdistrict office that serve no other function than full-time printing and distribution of land records. Obtaining a land record in Karnataka is now as simple as standing in a short line and paying a fee of \$0.30 USD. Those people who do not need a copy of their land records, but just want to see them, can use a self-serve kiosk to view a record for a fee of \$0.04 USD.

Because of the low cost of labor in India—including in the information technology industry—the cost of implementing this system was only about \$5 million USD, or some \$0.25 USD for each of Karnataka's 20 million land records. This amount will be recouped over time through

the \$0.30 USD fee for distribution of land record copies. Of course, the economic benefit to the state, through better availability of land records, will be much greater. As Jeffrey Smith (2001, para. 3) asks, quoting de Soto,

In a “world where ownership of assets is difficult to trace and validate and is governed by no legally recognizable set of rules; where the assets’ potentially useful economic attributes have not been described or organized; where they cannot be used to obtain surplus value through multiple transactions because their unfixed nature and uncertainty leave too much room for misunderstanding, faulty recollection, and reversal of agreement,” how can people prosper?

In Karnataka, because of the well-designed use of ICT to promote more transparent land record documentation and access, more people will now be able to prosper.

One important question to ask at this point is why Karnataka has been able to implement such an advanced system when no other Indian state and few other developing countries have done so? This is due partly to the technological infrastructure in Karnataka; Bangalore, the state capital of Karnataka, is the most important ICT hub in India and one of the major ICT centers in the world. Beyond that, though, the new state government, which took office shortly before this new system was implemented, had a strong vision of using ICT for human and social development. This is thus another example of how technological capacity must be combined with vision, leadership, and a commitment to social development in order to achieve an impact.

Citizen Feedback

State-society synergy cannot be fully developed just by providing information and documentation from the top down. Some kind of mechanisms for communication from the bottom up must also be provided. Citizen feedback to government acts as a check on bureaucratic abuse and corruption, alerts the government to citizens’ needs and concerns, and gives citizens a sense that they have a voice in society.

There are many means for giving citizens voice in government, such as providing free elections, a free press, and opportunities for organized public protest. However, all these means have their limitations. Elections take place only at intervals and are often heavily influenced by large

campaign donations or bribes, or by issues of patronage. A free press is similarly shaped by financial considerations, with media outlets reflecting the views of their owners or advertisers as much as those of the public at large. Opportunities for citizen association and protest are vital, but they are often not easily used by the poor, whose time and energy are dedicated to wage earning and survival.

Many people have looked to the Internet as a means for providing more rapid and flexible feedback to their governments. The possible advantages of this must be weighed against the possible disadvantage of giving greater voice to those who are already relatively privileged. That is one of the problems, for example, with e-voting, which could skew voter turnout to those who have computers and home Internet access, and who in most countries are disproportionately among the economically well-off.¹⁶

E-governance can help give voice to the marginalized if projects are designed specifically to reach the poor. An excellent example of this comes from an effort in India, the Gyandoot (purveyor of knowledge) project in the Dhar region.¹⁷ I have briefly referred to this project earlier and now explain it in more depth because it represents a fascinating example of e-governance in one of the poorer regions of the world.

Dhar is a mostly rural district in Madhya Pradesh, the second poorest state in India. About 1.7 million people live in the district, spread out over some 100 villages. The vast majority of the population in Dhar comprises small farmers and agricultural laborers, and 57% are illiterate. According to organizers of Gyandoot, some 60% of the district residents are below the poverty line, which is defined in India as lacking sufficient nourishment. Some 54% are members of tribal groups, including large numbers of low-caste members.

The Gyandoot project was initiated by the district administrative leadership to overcome poverty and social marginalization. Unlike most ICT initiatives in rural India (and other countries), it was initiated neither by foreign donors or international agencies, nor by private business, but by local government officials in an impoverished region. The goals of the Gyandoot project are to provide better governmental information and services toward enhancing economic and social development. Its initiators have targeted the poor and marginalized and have been largely

successful in reaching their audience; some 87% of Gyandoot users have incomes of less than \$400 per year, and 53% are members of tribes or lower castes (Rajora 2002).

Gyandoot has two main components. One component is a collection of Internet kiosks throughout the district. Some thirty-six kiosks have been set up to date, each one managed by a local entrepreneur, who works either on his own or on behalf of the local village council. The Gyandoot project supplied a computer and phone line to each of the kiosks. The managers charge a small fee for their services (usually about \$0.10 USD per transaction) to offset the ongoing costs of the operation and to earn their own income. Most users who come to the kiosk do not use the computers themselves but purchase services or information via the kiosk owners. The principal exception to this is the large number of children, who are sent by their parents for individualized computer instruction from the kiosk managers.

There is little information available on the Internet of interest to the Dhar villagers, and even less in the Hindi language. Thus the second component of the Gyandoot project is a districtwide intranet of Hindi-language information that has been especially developed for the needs of the rural poor. The intranet is developed and maintained by a small team in the Dhar district government offices and includes a wide range of information: copies of land records (though not yet in a complete and updated fashion as in Karnataka), governmental forms, applications for governmental permits, information about governmental programs (especially the many Indian programs that are designed to serve tribal members and people below the poverty line), and market rates for local crops. One section of the intranet is devoted to e-education and includes sample questions for state exams, educational quizzes, mathematical puzzles, and career guidance information.

Probably the most interesting part of the Gyandoot intranet, though, is that it also allows for a two-way process of communication. Citizens cannot only receive information but can also post it. Interactive services include an online market place (where people sell cows and bicycles), an online matrimonial service, and an online complaint service. From my interviews with kiosk managers and users in several Dhar villages, I learned that the online complaint service is an especially valued

component of the Gyandoot project, and one that has had an important impact on villagers' lives.

The online complaint service comprises a Web page with a pull-down menu from which users can choose from twenty-one predetermined categories, including

- Nonpayment of salary, stipend, wages
- School closed or teacher absent from school
- Absence of a veterinary doctor
- Complaint against the secretary of village council
- Nonpayment to farmers at auction centers
- Complaint against agriculture laborer accident insurance
- that Hand pump or transformer not working
- Complaint regarding beneficiary schemes for the members of tribes and lower castes

The district administration has guaranteed to respond to complaints in each of these twenty-one categories in seven days or less. This system is enforced through public posting of outstanding complaints on the intranet through the government district offices. That way, it is immediately obvious to both government employees and their supervisors which complaints have and have not been answered. Beyond the predetermined selections, people can make complaints on any issue they wish, but the government does not offer the seven-day guarantee on these.

Interviews with villagers indicated that the complaint system was highly popular and effective. The two most common issues mentioned involved hand pumps and schools. Both of these issues speak to the lack of government response that is common in rural India, and the power of more transparent, interactive communication to help improve such responsiveness.

Villagers in India get their water from wells by means of hand pumps that are typically spread out at 1–2 km distance from each other. If the nearest hand pump isn't working, villagers must make a tiring walk to the next hand pump and then carry the water all the way back to their homes. Prior to the development of the Gyandoot system, hand pumps in Dhar frequently fell into disrepair for months at a time because

government officials had little incentive to maintain them. Now, for \$0.20 USD, villagers can issue a public complaint about a broken hand pump and be virtually assured that it will be repaired within a week.

A second, and in the long run more important, issue for social development involves public schooling. Villagers and government officials alike in India complain that many village schools are poorly run. They may consist of a single teacher who never shows up at all or of a few teachers who show up rarely with the approval of an also-absent principal. The lack of accountability in the Dhar schools contributed to a vicious circle: the less often teachers showed up for work, the more families became discouraged and kept their children from school; the less often children came to school, the more teachers felt justified in not showing up for work. Resigned to poor schools, and lacking recourse to complain, villagers were often forced to accept the situation. With schools, as with hand pumps, villagers now feel they are in a position to defend their rights. Complaints about absent teachers or nonfunctioning schools were frequent in the early stages of Gyandoot and were replied to promptly by government officials. These complaints have now apparently slowed down as teachers and principals become more aware that their behavior is under public scrutiny.

This last point illustrates the benefit of this interactive system even for those who might never make use of it. According to informal reports, not only has schooling improved in the district but so have hand pump maintenance, provision of public benefits, and other governmental services. Basically, government officials are now aware that their performance will be subject to public complaint and criticism. Knowing that they will be held accountable for their work provides incentive for them to perform better. Well-designed use of ICT for society-government communication—as in the case of the Dhar district in India—provides a means of improving the social capital of those directly using the online service as well as the broader community.

Democracy

Another area related to macrolevel social capital and ICT access is democracy. The relationship of democracy and Internet diffusion is a broad theme that could in itself be the topic of an entire book. I restrict

myself here to a few comments and focus in particular on how this theme intersects with issues of ICT access.

Not surprisingly, prior research indicates that political openness and democracy are correlated directly with the spread of associational technologies, though not necessarily of broadcast technologies. So while the diffusion of television (a broadcast technology) is fairly uniform across societies, the diffusion of the telephone—a technology that facilitates private, horizontal communication and association among citizens—is positively correlated with measures of democracy and political openness (see, for example, a study by Buchner 1988).

Similarly, Robison and Crenshaw's (2000) international study of seventy-five countries found a substantial correlation between Internet diffusion and political openness and democratization. This is evidenced by the many authoritarian countries, such as North Korea, Syria, Saudi Arabia, and Sudan, which have put limitations on the rights of Internet users and service providers. One strategy for extending Internet use would be, it seems, to work toward greater democratization of authoritarian regimes.

However, the situation is more complex than this position implies, as witnessed by countries such as China and Singapore, in which authoritarian regimes have placed restrictions on the Internet while still allowing its rapid diffusion. In these cases, the country's leaders have embarked on a path of fast-paced economic development and are determined to make use of whatever tools are needed to accomplish the task. Indeed, both China and Singapore see the technologization of society as critical to their nation's continued economic success. In cases such as these, the more pertinent question is not whether democracy makes Internet diffusion possible but whether the spread of the Internet helps bring about democratization.

The short-term answer to this question is obviously no. Neither China nor Singapore have suddenly turned into Jeffersonian democracies simply by virtue of the fact of having large numbers of Internet users. And, indeed, both countries' governments have found substantial ways to harness Internet use to their own ends. These include "defensive" measures such as forcing citizens and service providers to make use of proxy servers, blocking the access of these proxy servers to overseas (and

domestic opposition) news sites, hiring censors to remove offensive material from bulletin boards, and closely monitoring Internet use at cyber cafés (Kalathi and Boas 2001; Rodan 1998). They also include “offensive” measures such as setting up government-sponsored portals, news sites, and discussion forums to try to mold public opinion in the government’s direction (Kalathi and Boas 2001). For the most part, China and Singapore have neutralized the Internet as a tool for public opposition. Yet, at the same time, both countries are slowly becoming more open, with political restrictions less harsh than in the past. This is due not solely to the expansion of the Internet but to broader socioeconomic changes of which Internet expansion is a part.

I would contend that this gradual opening of political space is a natural process and speaks to an important relationship between democracy and the Internet. As pointed out by Kranzberg (1985), technology is not good, bad, or neutral. The Internet cannot automatically be assumed to have “good” effects such as democratization or “bad” effects such as aiding government control. Certainly, the Internet can be put to either of these uses. But this does not mean that the Internet is inherently good or inherently bad. Of course, to complicate matters, neither is the Internet neutral. Rather, it has certain affordances based on its history and design. One of the most important affordances of ICT is that it greatly increases the benefit-to-cost ratio of horizontal, networked communication. For institutions to fully exploit the Internet, they need to take advantage of this particular affordance. Of course, the Internet can also be used in other ways, such as narrowcasting material from the top to a passive audience below. But if these narrowcasting (or broadcasting) features of the Internet are exploited without also making use of the opportunities for many-to-many mass communication, the full advantages of Internet adaptation will not be gained. This applies at many institutional levels, from business to education to society.

Shoshana Zuboff (1988), for example, carried out a five-year ethnographic study of eight large businesses in the United States that were adopting information and communication technologies. Zuboff noted that initially employers expected computers to help them automate their tasks, but that while automation effectively hides many operations within the overall enterprise, information technology instead illuminates

such operations. In other words, information technology improved productivity not so much by removing information and control from individuals (as in automation) but rather by expanding access to information and control by individuals. Zuboff used the word *informatize* to describe this process. Zuboff's study showed that firms that were able to make the shift from automating to informing processes—by learning how to divest more authority and control throughout the workplace—were best able to take advantage of the information revolution, whether measured by increased productivity, smoother operations, or satisfied employees. And those firms that were not able to make the change faced problems. As a mill worker in Zuboff's study explained, "If you don't let people grow and develop and make more decisions, it's a waste of human life—a waste of human potential. If you don't use your knowledge and skill, it's a waste of life. Using the technology to its full potential means using the man [sic] to his full potential" (Zuboff 1988, 414).

Similar results have been found in educational research. As discussed in chapter 5, democratization of the classroom, school, or institution is not the only element leading to effective use of information technology, but it is an important element. Indeed, my earlier analysis of the Egyptian Ministry of Education can be interpreted largely in terms of the difficulties inherent in trying to spread ICT without bringing about democratization of an institution.

A similar process takes place at the level of societies and governments. To fully exploit the Internet for social and economic development, countries need not only to extend physical access to computers and connectivity but also to informatize their societies. In other words, they need to expand power and control to individuals. This is in fact the dilemma faced by Singapore today, a country where widespread Internet availability and use have not yet had as broad an impact on the retooling of the economy as government leaders had hoped (indicated, for example, by the small ICT industry in Singapore and the limited Internet content production there; see Warschauer 2001c; Zook 2001c). An active debate is currently being waged among Singapore's government and economic elite regarding how to address this situation (see Yeo and Mahizhnan 1999), and in the meantime, Singaporean censorship of the Internet appears to be gradually decreasing.

In China the circumstances are somewhat different because the government is in a more volatile situation. At the same time, China has not yet faced the contradiction fully, because Internet diffusion, while accelerating, is still at a low per capita level. In the long run, if China is to continue its fast-paced economic development, the Internet will have to extend to new parts of the population, both sectorally (e.g., to the working class) and geographically (e.g., to the western, more impoverished parts of the country). At that point, the contradiction between the Chinese government's economic goals (requiring open information and interaction) and political approach (requiring media and communications control) may well come into more open conflict.

In summary, the Internet by itself does not bring about democratization or openness, but its diffusion does create new openings to struggle for democracy. How these opportunities will be realized depends to a large extent on popular action, so I now examine the impact of the Internet on voluntary associations and civil society.

Mesolevel Social Capital: The Power of Civil Society

Economists and social theorists point to a midlevel type of social capital between the microlevel of an individual's personal networks and the macrolevel of governmental institutions. There are various interpretations of mesolevel social capital, some of which include the role of corporate units (e.g., Turner 2000); however, for the purposes of this discussion, I focus on voluntary associations and civil society (see Woolcock 1998).

Civil society encompasses the networks, groups, organizations, and forms of association that exist between the private sphere and the state. It involves "*citizens acting collectively in a public sphere* to express their interests, passions, and ideas, exchange information, achieve mutual goals, make demands on the state, and hold state officials accountable" (Diamond 1994, 5, emphasis in original). According to Diamond, civil society performs a variety of vital democratic functions. First, it serves to monitor and restrain the exercise of state power, checking abuses and violations of the law and subjecting governments to public scrutiny. Second, it supplements the role of political parties in stimulating

political participation on the part of the citizenry, increasing the political efficacy and skill of democratic citizens, and promoting an appreciation of the obligations and rights of citizenship. Third, civil society can be a crucial arena for the development of other democratic attributes, such as moderation, tolerance, a respect for opposing viewpoints, and the willingness to compromise. Fourth, it provides a vehicle beyond political parties for the articulation, aggregation, and representation of interests; this is particularly important for marginalized groups whose voices are not well represented by established political structures. Fifth, by allowing a range of cross-cutting issue-based movements to arise, civil society can help mitigate the polarities of political conflict. And finally, a democratic civil society can be critical for recruiting and training new political leaders beyond those who might emerge solely within political parties.

Alexis de Tocqueville, a nineteenth-century political theorist who wrote extensively on the role and value of citizens' associations, pointed to two technologies that are vital for their success: the meeting hall and the newspaper. The former provides citizens with an opportunity to directly communicate with each other, share opinions, form human bonds, and organize plans. The latter allows ideas to be broadly projected to association members and supporters. In his day, at least, it seemed true that "nothing but a newspaper can drop the same thought into a thousand minds" (Tocqueville 1835, 119).

However, both the meeting hall and the newspaper face important limitations today (see Klein 1999). A meeting hall can only bring together those people who either live in an immediate area or who can afford the time and expense to travel from a distance. Spatial and temporal barriers may make mass participation difficult, and the logistics of large meetings may make it difficult for all to have their voices heard. The costs of holding or attending meetings may also deter participation, especially among groups and individuals who are struggling financially. Finally, the many comments and ideas made at a meeting are often lost or subject to differing recollection, since they are not usually all recorded in an easily accessible form.

A newspaper overcomes some of these barriers only by substituting new ones. While a newspaper overcomes difficulties of space and time,

it allows no forum for rapid interaction among group participants. Cost and publishing barriers also limit the extent to which it can serve as a medium of many-to-many communication.

In this light, the Internet can be seen as almost a miracle technology for citizens' groups. In a single low-cost technology it merges the roles of the meeting hall and the newspaper, and overcomes the limitations of each. "Meetings" can now be held by a limitless number of people all over the world on an ongoing basis, with comments and ideas automatically recorded for further analysis and discussion. Electronic newspapers, e-zines, and online discussion forums can drop a single thought into thousands of minds and also allow each of those thousands to interact immediately by replying to the author or to others.

That, at least, is the idea. How are citizens' groups actually using the Internet, and does this serve to empower those who are most marginalized? I examine two types of online communication: that among nonpolitical organizations and groups, where the primary benefit comes from exchange of information and social support, and that which is more explicitly political, where the goal is to aggregate and express demands.

Nonpolitical Association Online

The Internet potentially provides a valuable medium of communication for geographically dispersed people with shared interests. Everyone from sports fans to pet owners to alcoholics can go online to share information, find social support, and simply think together—a process referred to as *collective cognition*. Agre (1999a) explains,

Collective cognition in its various modes is greatly facilitated by the various community-building mechanisms of the Internet. Ideologies can form in the networked community of computer programmers; news can spread in the networked community of nurses; experiences can be shared in the networked community of cancer patients; patterns can be noticed by the networked community of pilots; agendas can be compared by the networked community of environmental activities; ideas can be exchanged in the networked community of entrepreneurs; stories can be told within the networked community of parents; and so on.

As Agre also points out, the opportunities for online networking provide special opportunities for marginalized groups, allowing them to level the playing field in situations that would normally disadvantage

them. Doctors, business owners, and homeowners may already have plenty of channels of communication to protect their relative privileges, whereas patients, workers, and renters might need the extra affordances provided by the Internet. In some situations, the Internet's most important role may be to allow people simply to find each other. For example, large numbers of gays in China are said to have made contact with one another through U.S.-based Internet sites, and this in turn has contributed to a broader social assertiveness among, and public acceptance for, Chinese homosexuals (Pomfret 2000).

As an example of associational networking among groups in society, I briefly discuss female patients' Internet use in the United States. The United States is alone among wealthy industrialized countries in its lack of a national health care system. Approximately one in five Americans lack any health insurance, and those who are insured face a complicated network of opaque regulations, permission procedures, reporting regulations, and payment schedules that makes accessing health care a serious challenge. A growing number of Americans are insured via health maintenance organizations (HMOs) that hold down their costs through systems of complex barriers that restrict patients from obtaining expensive medical treatment. Indeed, a lack of knowledge about how the health care system works can in many cases be a matter of life and death because patients are too often discouraged (either directly or by bureaucratic roadblocks) from obtaining the health care they need.

This system is characterized by a vast gap between doctors and patients. Medical doctors in the United States are highly paid but are usually under various sorts of managerial pressure to limit their contact with patients or the information they provide them. HMOs often put doctors on tight schedules, rationing the time they can spend with individual patients in order to cut back on expenses. Doctors are also discouraged from providing too much information, either because this may take up too much time or because it might encourage the patient to seek expensive-to-the-insurer alternative tests or treatments. Doctors' fear of malpractice lawsuits also can discourage them from providing direct and clear information that is not hedged by legalese language.

Women in the United States are particularly burdened by this hard-to-negotiate health care system. On the one hand, women must take

responsibility not only for their own health but also, in most cases, for the health of their children (and often other family members). Doctors in the United States, on the other hand, are disproportionately male. The result is a frequent gender gap in doctor-patient communication (Fairclough 1989; Tannen 1994; West 1990). In addition, women generally have lower incomes than men and frequently participate in part-time work. This means that women are more often without health insurance or have greater financial difficulties in covering medical expenses. In these circumstances, it is not surprising that women have turned to the Internet in large numbers to seek information, support, and solidarity about their health concerns.

A number of studies have found that health sites are among the most widely used on the Internet. A 1998 survey found that 46% of online users sought information via the Internet about a medical or personal problem (Green and Himelstein 1998). Health chat rooms and discussion groups are also widely visited (Lamberg 1997). Within the Yahoo! Groups discussion forums alone, there are more than 25,000 e-mail lists devoted to topics of health and wellness.¹⁸ In addition, there are probably an equal or greater number of health-related Web sites, many of which combine online forums with links to background articles, testimonials, and other information.

Online forums can play a critical role in people's health. Studies have indicated that the amount of emotional support a patient receives is associated with fewer declines in social function and fewer medical problems (Bloom 1982; Dimond 1979). Patients can turn to the Internet when other sources of support are not readily available. Turner, Grube, and Meyers (2001, 235) explain this process:

As an illness constitutes an uncontrollable event that may influence several domains of an individual's life (income, contact with others, sense of achievement, physical capacity), support from others that responds to each of these domains can help achieve optimal adjustment. . . . Unfortunately, available support from others who understand the impact of the illness on these various life domains is not always available. Individuals may not be able to attend a support group targeted at their specific illness. However, with the advent of online support communities addressing specific concerns within individuals' lives, and the thousands of participants within these communities, the mathematical probability of a person finding someone with the same illness and treatment alternatives increases exponentially. For example, a patient can return home from

being diagnosed, log in to an online community concerning the diagnoses, and ask about treatment alternatives or just express concern. Within minutes, that patient can receive specific responses to the posting. Similarly, the patient can learn about the diagnosis simply by reading the discussions taking place. The participants within online communities provide receptivity, interest, and disclosure, despite that they are strangers otherwise, because they can share a critical commonality. Therefore these large groups provide a strong probability that participants can find one or many other individuals who share similar specific symptoms treatments, reactions, problems, and challenges.

The value of these online support communities ties in with the theory of weak social ties discussed earlier in the chapter. Weak-tie relationships exist outside the dynamics or pressures of family relationships and are often contextual in nature (Adelman, Parks, and Albrecht 1987). The relative anonymity and objectivity provided by weak-tie relationships can thus provide an important alternative source of social support beyond that offered by family members.

Turner, Grube, and Meyers (2001) carried out a study of online communication on seven cancer-related e-mail discussion lists. Their study found that a 71% of the participants on the lists were women and that the amount of time people spent on the lists was inversely proportional to the amount of support they received from face-to-face partners. During the occasions when participants reported a lack in face-to-face support, they spent a greater amount of time online.

I spent several months investigating and participating in infertility online discussion forums during 2001. There are hundreds of such forums available on the Internet,¹⁹ and they are overwhelmingly female in composition, even though infertility is a problem that affects both men and women. I found in these forums a highly ritualized environment, complete with its own elaborate set of code words, abbreviations, specialized greetings, and rules and regulations to guarantee a supportive environment. The nature of the discussion on these forums indicated the confluence of gender, class, and social issues that confront women with infertility problems. Common themes include exchange of medical information (e.g., trying to decipher what ought to have been explained clearly by doctors); investigation of medical clinics (e.g., trying to identify those whose staff are supportive, reliable, and competent); discussion of financial options (e.g., formulating strategies for financing

expensive procedures that are rarely covered by insurance in the United States); and the sharing of all sorts of social support (badly needed in a culture in which women are often stigmatized for an inability to have children). One of the most common rituals is the formation of “cycle buddies,” that is groups of women who are going through the same fertility procedure at roughly the same time who share notes and offer solidarity and support. These types of groups would be virtually impossible to organize on a face-to-face basis, and provide an example of how the Internet can facilitate access to new forms of social capital.

Involvement in online forums and networks does not replace the support of family and friends. Usually, online involvement focuses on a particular topic or shared interest rather than offering the more general type of support that comes from strong social ties. The person who offers a virtual hug on a breast cancer listserv is not likely to drop over to babysit, give you a ride to the auto mechanic, or invite you to the movies. Yet online involvement does provide an opportunity for creating and maintaining all sorts of beneficial horizontal associations that make our lives and our society richer and provide valued resources for those most in need.

Political Association Online

Though all communication takes place in a political context—and what could be more political than the U.S. health care system?—many forms of online association, such as those just described, do not have explicit political agendas. I now turn to the use of the Internet by nongovernmental organizations (NGOs) and popular movements with more explicit political or social agendas. The question driving this section is, Does the Internet help level the political playing field by extending greater communications and organizational power to those who lack it?

At first glance, the answer would seem to be yes. The past two decades have witnessed a virtual explosion of third-sector (nonstate, nonbusiness) political and social activity. According to one scholar of this movement, the long-term impact of this global “associational revolution” may prove to be “as significant to the latter twentieth century as the rise of the nation-state was to the latter nineteenth century” (Salamon 1994, 109).

And ICT has played an important role in the development of this third sector. International NGOs have used the Internet to share documents and coordinate strategies and campaigns. Grassroots groups use the Internet to mobilize their members and organize protests. And potential new activists are reached with information and articles on Web sites.

Probably the largest and most significant international social movement that has benefited from the use of the Internet is the antiglobalization movement. International use of the Internet by antiglobalization groups dates back to the 1980s, when international NGOs such as Greenpeace developed global communication networks for their staff. In 1990 the Association for Progressive Communications was born as a global network of social activists, created several years before the development of the World Wide Web.

The first major Internet-based campaign of the antiglobalization movement came in 1994, when the Zapatista rebels of Southern Mexico launched an armed rebellion. As pointed out by Ronfeldt et al. (1998), the Zapatista movement comprises three layers: (1) a social base of indigenous Mayan groups with a wide array of grievances against the Mexican government; (2) the Zapatista leadership of middle-class intellectuals who went to Chiapas in southern Mexico to create a guerrilla army and who articulated an antiglobalization agenda (e.g., militant opposition to the North American Free Trade Agreement and U.S. investment in Mexico); and (3) Mexican and international NGOs who regularly mobilize in support of Zapatista aims and campaigns.

From the beginning, the Zapatista leaders showed great skill in exploiting the Internet and other international media for their cause. Although popular images of the Zapatista leader, Sub-Comandante Marcos, uploading communiqués from his laptop deep in the jungle are almost certainly an exaggeration, the Zapatistas did coordinate with their supporters in Mexico City to have their materials typed or scanned into electronic format and distributed via the Internet. Within a short time after the rebellion had started, an unofficial Zapatista Web page was set up on the Swarthmore College Web server in the United States and a large number of Zapatista e-mail lists and Web sites were established throughout Mexico (Cleaver 1998). In 1995 the Zapatistas organized a national and international plebiscite to seek feedback from their

supporters. Some 81,000 people from outside Mexico reportedly participated in the conference, mostly via the Internet (Cleaver 1998). E-mail communication later became key to the logistical and political planning of two intercontinental meetings, one of 3,000 people in Chiapas, Mexico, in 1996 and a second, of 4,000 people, in Spain in 1997, which together assembled grassroots activists from some forty countries.

The Internet proved critical for coordinating support among a diverse array of groups. The NGO network supporting the Zapatistas included issue-oriented NGOs, such as those supporting indigenous rights (e.g., the International Indigenous Treaty Council); human rights (e.g., the Inter-Church Committee on Human Rights in Latin America); and sustainable development (e.g., Food First). Especially important were infrastructure-building and networking-facilitating NGOs such as the Association for Progressive Communications and the U.S.-based PeaceNet (Ronfeldt et al. 1998).

Despite such widespread support, the Zapatista movement eventually lost steam, as neither its antitrade ideology nor its violent tactics could sustain substantial long-term support from its immediate social base or from the broader Mexican left. Nevertheless, in its few years of peak activity, the Zapatista uprising—by spawning an internationally coordinated online solidarity network—helped give birth to a much stronger antiglobalization movement, now linked and coordinated through the power of the Internet.

The next major Net battle of the antiglobalization movement arose in the period 1997–1998, following the World Trade Organization's proposal of an international trade accord called the Multilateral Agreement on Investment (MAI). In 1998 a draft proposal of the MAI was leaked onto the Internet, where it spread like wildfire. Although the MAI was largely overlooked by the mainstream media (leading a group called Project Censored to award the MAI its annual prize for corporate media "self-censorship"), an alternative Internet-based media campaign picked up the slack (Redden 2001). At least twenty anti-MAI coalitions launched Web sites opposing the accord; scores of other Web sites were initiated by advocacy groups, trade unions, and individuals (Smith and Smythe 1999). Local protests were organized in many countries, and in the end the MAI was never adopted. Though the demise of the MAI may

have had more to do with the objections of potential signatories (e.g., France) than with grassroots campaigns, the movement did serve to further mature the Internet-enabled antiglobalization movement and whet its appetite for future battles.

Those were soon to come. Meetings of the World Trade Organization (Seattle 1999), the World Economic Forum (Melbourne 2000) and the World Bank/International Monetary Fund (Prague 2000, and Quebec 2001) provided new opportunities for antiglobalization groups to mobilize their forces. And once again, the Internet played a critical role. The Internet proved a perfect medium for organizing demonstrations that—unlike the large peace and civil rights protests of the 1960—had neither formal leadership nor unified demands. Rather, these protests became huge networked umbrellas to bring together a diverse array of organizations and individuals from Teamsters to anarchists, each with their own gripes and viewpoint. Umbrella Web sites, some of them anonymous, became critical in coordinating these disparate groups and fulfilled the dual role of Tocqueville's meeting hall and newspaper. As Redden (2001) explains, discussing a Web site used for the Melbourne protest:

The anonymous website S11.org provides a good example of how an Internet presence can increase grassroots communication and enhance the ability of protestors to mobilise. Along with related email discussion lists, it was instrumental in organising the large demonstration at the meeting of the World Economic Forum in Melbourne between September 11 and 13, 2000. Affinity groups from around Australia were able to co-ordinate their plans through the information provided by the Melbourne S11 Alliance online. Not only was information available at all times for groups in all locations, but its hypertextual form allowed easy, continual editing to reflect developments, while an overall structure with which users became familiar was maintained. The multimedia aspects of the site enhanced the production values to a level beyond that normally associated with activist literature. The first level sections were "home", "events", "call-2-action", "Melbourne groups", "regional groups", "organising", "accommodation", "protesting tips", "propaganda", "what is the WEF", "corporate profiles", "issues", "FAQs" and "links". These sections provided not only organisational information for those already committed, but also persuasive critiques of corporate globalisation, supplied by affiliates. During its time of peak operations it had one of the highest hit rates for any Australian website.

Eventually, permanent Web sites emerged to inform and coordinate the antiglobalization movement between its international demonstrations.

The best known and perhaps the largest is that of the Independent Media Center.²⁰ With background pieces, discussion forums, an online newspaper, links to listservs, a searchable archive, news updates provided by e-mail, and a sophisticated collection of photos and video, the site serves as a one-stop organizing center for the antiglobalization movement. Visitors to the site in September 2001 could find immediate links and information about nine major antiglobalization protests organized for October and November of that year.

For the antiglobalization movement and other resistance groups, the Internet does not supersede other forms of communication but supplements and expands them (see De Vaney, Gance, and Ma 2000). Redden (2001) discusses the mutually reinforcing use of new and old media by the antiglobalization movement:

The radical information published on the Internet is often available in print form, and activists typically use the Net as one medium among others through which they may work. Online activism often ties in with print media, with journalists sourcing information from websites, and magazines and leaflets quoting URLs. Many of the large convergences of people in demonstrations against corporate globalisation that have taken place since Seattle owe their scale to online organising between geographically dispersed interest groups. In these cases the Internet is used as a kind of metaconnection between more traditional local-level organisational activities such as meetings, telephone trees, leafleting, and posting flyers and stickers. Not only does online synergy translate into bodies on very "real" streets, but the protests in turn have been instrumental in bringing the critique of globalisation onto the agenda in broadcast media. So in exactly what medium does "reality" reside? Online networking has brought new possibilities of fast translocal mobilisation to the culture of activism, rather than having done away with all of its old elements. It seems to me to be more than a coincidence that the evolution of the Net has been continuous with the formation of new activist alliances on the basis of already existing activist communities. The Net has enhanced relationships between geographically dispersed and issue-based groups. As Roland Bleiker argues, "The phenomenon of speed has not annihilated dissent". It has transformed it.

All this would seem to suggest that the Internet is an unadulterated positive for the development of civil society and for the defense of marginalized groups. Certainly, the antiglobalization movement would not have achieved its current impact without the Internet. However, there are drawbacks to consider. The first, and most important, is that the Internet as a political tool tends to privilege those who have most access

to it. This is not that critical a matter for nonpolitical associations, which are to a large extent non-zero-sum. For example, if cancer patients benefit from increased social support, that benefits society as a whole and harms no one. However, political activity can be considered zero-sum. Anything that strengthens one group's ability to promote its agenda thereby weakens the interests of those social forces with an opposing agenda. Looking again at the antiglobalization movement, the Zapatistas never used the Internet with their own indigenous base but mostly with its white, middle-class supporters in North America and Europe. This same relatively privileged social group—with its extensive access to computers and its high degrees of education, literacy, and English-language skills—has continued to dominate the antiglobalization movement. It is not an accident that antiglobalization protests focus to a large extent on protectionist issues (e.g., opposition to genetically modified agricultural products) that reflect the concerns of the protesters' own social class and cultural backgrounds. Other globalization-related policies that might benefit the poor in developing countries, such as ending rich-country tariffs on developing nations' imports, are given short shrift in antiglobalization protests. In other words, as long as unequal access to ICT persists, the expansion of the Internet as a political tool is as much a threat to the poor as it is an opportunity. The same principle applies here as in online voting: a disproportionate expansion of the communicative power of one demographic group can harm the interests of those groups whose voices have not been equally amplified.²¹

In addition, and as discussed earlier, the Internet favors weak social ties rather than the stronger ties that come from face-to-face communication. These weak ties are ideal for the types of “segmented, polycentric, ideologically integrated networks (SPINs)” that have emerged recently (Levine 2001, para. 22). These include the Zapatista movement, the antiglobalization movement, or even the international network of neo-Nazis. But, as Levine points out, these SPINs are not necessarily as solution-oriented as the kind of face-to-face movements that dominated earlier eras, such as the civil rights movement. As he explains,

SPINs need neither money nor enforceable rules; instead, technology minimizes transaction costs and shared values motivate members. SPINs have indeed protested and disrupted other institutions, but I doubt that they can devise (let

alone implement) positive programs. For instance, the anti-globalization movement has put protesters on the street, but it seems incapable of creating a new system of international trade. (Para. 22)

The Internet also allows for an extreme form of narrowcasting and information filtering that might go against the interests of civil society. In reading a newspaper or watching the television news, citizens will come across issues and ideas that might surprise them. In contrast, the Internet allows people to restrict their news and communication channels to extremely narrow fields, and actually can discourage the kind of tolerance and informed compromise that comes from exposure to a wide range of ideas and people (Sunstein 2001).

Finally, even in situations when the Internet does provide political space for persecuted groups, it may also create new tools for surveillance and infiltration. For example, at one stage the Internet provided a powerful means for the Falun Gong to clandestinely organize in China (O'Leary 2000), but it later provided an equally powerful means for the government to track down and arrest Falun Gong members (Rosenthal 2001).

Conclusion

Whether at the micro-, macro-, or meso-level, preexisting social capital can have an important influence on individuals' and groups' ability to use ICT, and if properly exploited, ICT can be promoted in ways that encourage the development of social capital. Strategies that take into account the social nature of access, recognize the interaction between face to-face and online communications, and combine Internet use with a broad range of other new and old media provide the best opportunities for promoting social inclusion through use of ICT.

