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Defining Digital Citizenship

Citizenship is a status that is bestowed on those who are full members of a community.

—T. H. Marshall, "The Problem Stated with the Assistance of Alfred Marshall," 1949

"Digital citizenship" is the ability to participate in society online. What, however, does it mean to invoke the notion of citizenship in relation to the use of a technology? More than half a century ago, British sociologist T. H. Marshall defined citizenship as endowing all members of a political community with certain civil, political, and social rights of membership, including "the right to share to the full in the social heritage and to live the life of a civilized being according to the standards prevailing in the society" (1992, 8). Information technology, we argue, has assumed a secure place today in the civilized life and prevailing standards of U.S. society. In much the same way that education has promoted democracy and economic growth, the Internet has the potential to benefit society as a whole, and facilitate the membership and participation of individuals within society. We contend that digital citizenship encourages what has elsewhere been called social inclusion (Warschauer 2003).

We define "digital citizens" as those who use the Internet regularly and effectively—that is, on a daily basis. Previous research has defined a "digital divide" in terms of access to technology (Norris 2001; Bimber 2003) or the skills to use technology as well as access (Mossberger, Tolbert, and Stansbury 2003; Warschauer 2003; Van Dijk 2005). Daily Internet use implies sufficient technical competence and information literacy skills for effective use along with some regular means of access. In 2006, digital citizens accounted for a little under half of the U.S.

population. Twenty-seven percent of Americans still do not go online at all, and are completely excluded from participation in society online (Pew Internet and American Life Project 2006).

This book examines three aspects of participation in society online: the inclusion in prevailing forms of communication through regular and effective use; the impact of Internet use on the ability to participate as democratic citizens; and the effects of the Internet on the equality of opportunity in the marketplace. Digital citizens are those who use technology frequently, who use technology for political information to fulfill their civic duty, and who use technology at work for economic gain. To understand the potential and challenges for digital citizenship, we turn to Rogers Smith's three traditions of citizenship in U.S. history: Lockean liberalism (equality of opportunity), civic republicanism (politics), and ascriptive hierarchy (inequality). These traditions demonstrate how Internet use is integral to citizenship in an information age, and why political and economic uses of the Internet differ from other activities online. The ability to participate in the civic sphere and compete in the economic realm are both central to U.S. conceptions of citizenship as embracing political community and equality of opportunity.

The following pages present new evidence that Internet use does indeed have significant benefits for democratic participation and economic welfare. We find that Internet use increases the likelihood of voting and civic engagement; it also promotes higher incomes for African Americans and Latinos in particular. Our findings establish that patterns of exclusion endure even as Internet use has grown, and that they are linked to other inequities. Economist Amartya Sen (1993) has argued that poverty and inequality should be viewed not in terms of material possessions but in light of the capacities and functioning of the members of a society. The capacity to use the Internet includes access to technology at home and in other settings, and educational and technical skills. Drawing on Sen and our empirical findings, we view digital citizenship as representing capacity, belonging, and the potential for political and economic engagement in society in the information age.

The Role of Public Policy and the Internet

The Internet is a unique technology in its varied properties and wide range of uses. It is interactive, enabling point-to-point communication

through e-mail, chat rooms, and instant messaging, but also supports broadcast capability through text, video, and visual images on Web sites (DiMaggio et al. 2001; Wellman 2001). It is a telephone, library, and soapbox; it is a storehouse of information and channel for communication (DiMaggio et al. 2001). These varied properties enable new forms of participation, which may either change or replicate existing social relations. Some observers have compared the Internet to the invention of the printing press, which stimulated the demand for greater literacy in society (Rainie 2005). Such a far-reaching technology clearly has policy implications, but how best do we understand these? There are two different frameworks that can be used to evaluate the need for public policy intervention. Welfare economics emphasizes collective benefits and spillover effects. Political theory addresses the rights of citizenship and issues of social justice. While the following chapters are based on the latter, we briefly consider the spillover effects of Internet use for society as a whole before discussing traditions of citizenship.

Collective Benefits and Externalities: The Economic Perspective

Information technology has many aspects of what economists call positive externalities, which are social benefits beyond those reaped by the individuals who use the technology. If information available online helps citizens to be more informed about politics and more inclined to participate, then society as a whole profits from broader and possibly more deliberative participation in democratic processes. If modern communication technologies offer new channels for contacting officials, discussing issues, and mobilizing, then the network externalities or the benefits of bringing people together online exceed the satisfaction gained by the individual participants.

There is already evidence of spillover economic benefits as a result of readily accessible information and communication online. Technology use in industries throughout the economy has resulted in productivity gains (McGuckin and Van Ark 2001). If technology skills contribute to the development of human capital throughout the economy, including in economically underdeveloped urban and rural areas then the U.S. economy benefits. Inequality in technology use can be justified as a public policy issue if there are market failures that produce underinvestment and inhibit society's potential to capture the full benefits of the technology. This is one reason why the Internet is more than just another

commodity, and why its diffusion throughout society is a matter of public concern. Expanded technology use represents positive externalities for society that may justify a public policy response.

Our concern here, however, is based less on the logic of spillover benefits and the positive externalities of Internet use. Instead, we examine whether and how the Internet is integral for economic opportunity and political participation, and whether on that basis, all Americans should have the ability to use the Internet, if they so choose. This implies a concern for *equality*, not just a utilitarian calculation of market efficiency based on the relative costs and benefits. For this, we turn to political theory and an analysis of multiple traditions of citizenship to place the issue of digital inequality within the larger context of social equity in the United States.

From Spillover Effects to Citizenship

As mentioned earlier, Smith argues that there are multiple and contending U.S. traditions regarding citizenship: liberalism, republicanism, and ascriptive hierarchy. These traditions frame our understanding of the issues related to digital citizenship. Economic opportunity is a central concern of the liberal tradition, whereas political participation is critical in the republican tradition. Smith's discussion of ascriptive hierarchy explains the persistence of disparities based on race and ethnicity in U.S. society, including digital inequalities.

Liberalism and Economic Opportunity

Lockean liberalism (originating in the philosophy of John Locke) has been called the American creed by philosopher Louis Hartz (1955). It is an individualist perspective; that values individual rights, individual effort, personal liberty, and the free market (Hartz 1955, 4). Citizenship, within this framework, endows members of society with the right to pursue their own vision of the good life and be free from unreasonable government interference, such as restrictions on free speech. In this sense, individualism has a negative view of liberty.

Yet overlapping and sometimes conflicting with this tradition of individualism in liberal thought is egalitarianism. The very basis of liberal citizenship is the prior belief that Americans are "born equal," in the

words of Alexis de Tocqueville (Hartz 1955, 66). Comparing the development of political rights in the United States and western Europe, this belief in political equality resulted in the relatively early extension of suffrage, or the right to vote, at least to nonproperty-holding white men. The U.S. liberal tradition, though, has clearly defined economic as well as political implications.

In the economic sphere, U.S. public policy emphasizes the equality of opportunity rather than the equality of outcomes. As chapter 2 shows, U.S. citizens are willing to tolerate a greater income inequality than citizens of most other industrialized countries, and are more likely to stress individual merit as the key to success. Hartz refers to the "Horatio Alger" myth; others have called this "the American dream," and have demonstrated that the poor and the excluded often cherish most fervently the conviction that everyone has the chance to prosper (Hochschild 1995). Some scholars have described this belief in the equality of opportunity "the most distinctive and compelling element of our national ideology" (Rae et al. 1981, 64).

Implicit in the liberal tradition, however, is the expectation that the competition is fair. Government support for education stands in stark contrast to other social policy in the United States, in part because of the belief that education can provide a level playing field—the equality of opportunity, if not the equality of result. For this reason, Jennifer Hochschild and Nathan Scovronick (2000, 209) have perceptively called public education the U.S. version of the "welfare state." In the information age, digital citizenship may rival formal education in its importance for economic opportunity.

The information and communication capabilities of computers and the Internet have permeated the U.S. economy. Indeed, the impact of technology is visible in nearly every corner of the labor market, far beyond "high-tech" industries, and technology promises to increase throughout a range of occupations and industries (McGuckin and Van Ark 2001). For workers who are lower paid and less educated, computer and Internet skills may be one factor needed for mobility into better-paying jobs, with greater job security, health insurance benefits, and full-time hours. For those who are seeking new or better jobs, Web sites have become a tool for finding job openings and researching employers. Economic opportunity based on the traditions of liberalism may justify public policy

to expand technology access, beyond market arguments for improved efficiency.

Republicanism and Democratic Citizenship

A second political tradition in the United States is that of civic republicanism. Rooted in the practices of the New England town meeting as well as the ideology of the American Revolution, the republican ideal promotes the widespread participation of the citizenry (Bellah et al. 1985, 30–31, 253–256; Abbott 1991, chapter 2; Skocpol 1992, 19). Yet the basis of participation is a duty toward the community rather than the individual rights of liberalism—republican virtue that promotes the common good. Virtuous citizens must consider the needs of the whole rather than self-interest, and should be enlightened and informed in order to make good decisions on behalf of the community. For Thomas Jefferson, public education offered the means of developing the skills and commitment needed for a republican polity.

This differs from the liberal vision, where education serves to enhance individual equality of opportunity. Public education began to flourish at the same time as the expansion of the suffrage during the Jacksonian period of the 1830s, when property ownership was no longer required for the right to vote. According to Theda Skocpol, "The purpose of widespread basic education, the early school reformers declared, was not to help individuals get ahead but to educate a virtuous American citizenry to serve as the democratic backbone of the Republic" (1992, 19).

More recent proposals for participatory or "strong" democracy blend the republican values of civic virtue with liberal norms advocating political equality (Barber 1984, 118; Bowler, Donovan, and Tolbert 1998). To the extent that information technology enhances information capacity and mobilizes civic participation, it may be defended in terms of republican traditions of citizenship. What economists call the positive externalities of technology might also be seen as contributing to the larger public interest. In republican thought, "the virtuous citizen was one who understood that personal welfare is dependent on the general welfare and could be expected to act accordingly," to enhance the wellbeing of the community (Bellah et al. 1985, 254).

The growth of e-government and the explosion of political information on the Web mean that the Internet has already become an important

resource for civic and political information, through Web sites hosted by government, community organizations, interest groups, political campaigns, and news organizations, among others (Norris, Fletcher, and Holden 2001; Larsen and Rainie 2002; West 2004). Previous research has found that online news may have a mobilizing potential, increasing political participation (Bimber 2003; Krueger 2002, 2003; Tolbert and McNeal 2003; Shah, Kwak, and Holbert 2001; Graf and Darr 2004). Citizens who have used government Web sites report more positive attitudes about government at all levels, and even greater trust in government in some cases (Tolbert and Mossberger 2006; Welch, Hinnant, and Moon 2005).

In the following chapters we show technology use can facilitate civic participation, improving community engagement and democracy. Expanded technology access and use may also be justified on the grounds of promoting civic republicanism.

Ascriptive Hierarchy and Inclusion

Smith (1993) makes the argument that there is a third tradition in U.S. society, which he refers to as ascriptive hierarchy. This tradition has at times excluded large segments of the population from full citizenship based on ascriptive characteristics such as race, gender, or ethnicity. Historically, the slaveholding antebellum society of the South resembled feudalism more than liberal capitalism, and had an ideology that justified slavery and social stratification. African Americans first gained the right of citizenship only with the passage of the Fifteenth Amendment—a right that was still frequently denied in practice over more than a century of legalized discrimination comprised of white primaries, poll taxes, Jim Crow laws, and lynchings. The popularity of social Darwinism for many years is another manifestation of beliefs in ascriptive hierarchy that have flourished in the United States. Smith (1993) points to these not as a departure from U.S. ideals but as evidence of a more systematic and coherent tradition that legitimizes the exclusion of some groups from citizenship.

In the current context, those who formally possess the political, civic, and social rights of citizenship have often been deprived of inclusion as well. Rodney Hero (1992, 189) has called this "two-tiered pluralism," in which some citizens enjoy formal legal equality, but in practice suffer

discrimination and diminished opportunities. Smith (1993) contends that while there has been great progress toward liberal ideals such as equal opportunity, the long and persistent traditions of ascriptive hierarchy have made the struggle an arduous one where tentative gains are threatened by potential reversals. Donald Kinder and Lynn Moss Sanders (1996) show that many white Americans have more egalitarian attitudes toward African Americans and other people of color today, but they assume that the gains of the civil rights era have eliminated discrimination. There is less recognition of the role played by institutional barriers, such as the persistence of neighborhood racial segregation, and concentrated poverty within these segregated communities.

These enduring inequalities have shaped society online. The term digital divide has been used to describe systematic disparities in access to computers and the Internet, affecting Americans who are low income, less educated, older, African American, and Latino. Studies that have used appropriate statistical methods, such as multivariate regression, have demonstrated that income, education, age, race, and ethnicity all matter for having Internet connections at home (Mossberger, Tolbert, and Stansbury 2003) or using the Internet in any place (Katz and Rice 2002).[1] These disparities have continued over time, with the exception of gender. The gender divide in Internet access has nearly closed (Katz and Rice 2002; Mossberger, Tolbert, and Stansbury 2003, chapter 2), although men continue to be more intensive users of the Internet than women (Fallows 2005). There is also a parallel skills divide, which affects the same groups and may be even more critical for limiting Internet use. The ability to use the Internet entails technical skills using hardware and software, but also literacy along with the ability to use and evaluate complex information (Mossberger, Tolbert, and Stansbury 2003).

In the following pages, we discuss more recent gaps in high-speed/broadband Internet access and their impact on skills, and show that segregation and poverty play an important role in limiting technology access and skill as well. Chapter 5 reveals persistent disparities in daily Internet use, or digital citizenship, for Latinos and African Americans, the poor and less educated. Technology inequalities that overlap with existing societal inequalities based on race or ethnicity are consistent with Smith's notion of ascriptive hierarchy. Government policy to expand technology

use may be justified in removing barriers to participation online for racial and ethnic minorities, consistent with civil rights legislation.

Together, these multiple traditions offer a framework for understanding digital citizenship as an integral part of inclusion in the larger society, rather than simply providing entertainment, convenience, or even economic efficiency. Because the use of the Internet is now widespread in the United States, this new medium is affecting the way in which people engage in the public sphere and their individual economic pursuits. Like education, the Internet has the ability to provide information, skills, and networks that enable political and economic participation. Broadening access and skills supports the equality of opportunity and membership in the political community. Smith's notion of ascriptive hierarchy connects exclusion from society online with the more general fabric of discrimination and inequality. Although we find in subsequent chapters that poverty and class are also needed to fully explain digital exclusion, what we show is that inequality online does not stand apart from other inequities. We find that disparities online deepen existing inequalities and hinder full participation in society.

Digital Citizens as Frequent Participants Online

The issue of the digital divide first gained prominence in the middle of the 1990s after reports issued by the National Telecommunications and Information Administration depicted systematic inequities in home access to computers (U.S. Department of Commerce 1995).[2] The rapid growth in Internet use has meant that the Internet has become a part of daily life for an increasing number of Americans of all backgrounds. In 1997 only 18.6 percent of Americans had Internet access at home (U.S. Department of Commerce 1999). By the fifth NTIA report, *A Nation Online*, the population of Internet users constituted a majority of Americans for the first time, but there remained persistent gaps in Internet use based on race, ethnicity, age, income, and education (U.S. Department of Commerce 2002). Early work on technology inequality defined the digital divide in either/or terms—whether or not individuals have computer and Internet access at home. Recent research depicts churning in the Internet population, a more complex continuum of use, and the need for skills as well as access (Katz and Rice 2002; Lenhart 2003; Hargittai

and Shafer 2006). For these reasons, we argue that the frequency of use, especially daily use, more accurately measures digital citizenship than home access or simply having used the Internet at some point. Those who have Internet connections at home may still lack the ability to find and evaluate information online, for example, because of a lack of familiarity with search strategies or even limited literacy. Infrequent use at a public library may not sufficiently develop the skills needed for the workforce or provide sufficient time to find needed information.

How Should We Measure Use?

The Pew Internet and American Life Project has surveyed Americans about their use of the Internet since March 2000. At first glance, Pew surveys show that Internet use has grown appreciably, with 73 percent of the population in February–April 2006 reporting that they have gone online "at least occasionally" in some place—home, work, school, the homes of others, or at public access sites (http://www.pewinternet.org/trends/Internet_Activities_7.19.06.htm).[3] But if we examine the proportion of Americans who use the Internet on a daily basis, this segment has grown more slowly and is much smaller—48 percent in 2006.

As of January 2005, new wording in Pew surveys asked whether respondents had ever used the Internet "at least occasionally," totaling the responses for this question with the results for a separate and similar question about the use of e-mail "at least occasionally." A respondent who had used the Internet once is counted as online using this measure. There is some utility in knowing the percentage of Americans who have had *any* experience at all with the Internet, but this does not represent the percentage able to use the Internet effectively. The question wording before January 2005 asked whether respondents ever used the Internet or e-mail. The addition of the phrase "at least occasionally" may have prompted some respondents who were infrequent users to answer in the affirmative, although this is difficult to assess.

Box 1.1 below depicts trends in the percentage of Americans using the Internet from 2000 to 2005, based on the questions that Pew has used to define the Internet population in the right-hand column. On the left, we show what the growth of the Internet over the same period looks like focusing only on those for whom the Internet is a part of their everyday lives.

Box 1.1
Daily and Occasional Internet Use, 2000–2006

	% of Americans Used Yesterday	% of Americans Occasional Use
Feb.–Apr. 2006	48	73
Feb. 2005	40	67
Feb. 2004	35	63
Feb. 2003	39	64
Jan. 2002	36	61
Feb. 2001	31	53
Mar. 2000	29	48

For 2005: "Did you happen to use the Internet yesterday?" was used for half the sample, and half the sample was asked the question below, used prior to January 2005. The new wording was used in 2006.

Prior to 2005: "Did you happen to go online or check your e-mail yesterday?"

For 2005 and 2006: "Do you use the Internet, at least occasionally? Do you send or receive e-mail, at least occasionally?"

Prior to 2005: "Do you ever go online to access the Internet or the World Wide Web, or to send or receive e-mail?"

Source: Major Moments Survey, Pew Internet and American Life Project (see February–March 2005 questionnaire/topline, which includes results from previous years; see questionnaire for May–June 2005, which accompanies the Fox 2005 report, *Digital Divisions*). Questionnaire does not include daily use or frequency of use. All data available at ⟨http://www.pewinternet.org⟩.

Measured by any amount of use, the percentage of Americans online has grown by about half since 2000. Using a question about whether individuals had used the Internet yesterday, we can see that there has indeed been growth in frequent use, from just under 30 percent of Americans in 2000 to about 48 percent in 2006.[4] This is a significant achievement, demonstrating the growing relevance of the Internet in daily life. Still, only two-thirds of those counted as Internet users went online daily as of 2006 (Madden 2006). As chapter 5 will show, variations in the frequency of use are not random but are patterned along the lines of social inequalities such as race and class.

We believe it is crucial to address the issue of how to measure Internet use, and how this influences public policy. As political scientist Deborah Stone (2002, 176) has noted, counting is not a neutral act, for it involves the way that we define issues and policy priorities. Pew reports such as "Digital Divisions" (Fox 2005) present a more nuanced picture, and acknowledge that their measures include Americans who have casual or irregular connections to the Internet. But policymakers, the media, and even some scholars see the rising numbers and assume that the gap in Internet use is vanishing, and that it is time to divert attention and resources in another direction.

The debate over how to measure Internet use has colored government reports and administration positions as well in the past few years. Earlier reports and academic studies of the digital divide focused on home access to computers and the Internet with the assumption that it provides the most frequent opportunities for use (U.S. Department of Commerce 1995, 2002; Norris 2001). The fifth NTIA report, *A Nation Online*, was the first government report to measure Internet use at any location, rather than home access, leading to an expansion of the population officially counted as online (U.S. Department of Commerce 2002). As discussed above, the 2005 Pew survey enlarged this definition even further, by including those who only occasionally have used the Internet in any venue.

Frequency is a more appropriate way to measure Internet use than either home connections or occasional use. Daily Internet use *is* most likely to occur at home, as box 1.2 shows. But a small minority of those who go online daily—20 percent or less—have used the Internet primarily at work. And as we demonstrate in chapter 2, use at work can be important for economic opportunity. Access is merely a means to an end; it is the ability to use information technology that is the ultimate goal. Digital citizens use the Internet every day for a wide range of activities; the Internet becomes integrated into their daily routines and they are more likely to acquire the skill to use the technology.

A Continuum of Access and Skill
A final reason for relying on the frequency of use as a key measure is that there is a continuum of capacities online in terms of both access to technology and the skills to use it. A useful way of thinking about informa-

Box 1.2
Where Frequent Users Go Online

	% of Those Going Online Yesterday Used the Internet at . . .		
	Home	Work	Both
Feb. 2005	54	17	25
Feb. 2004	55	19	23
Feb. 2003	53	20	24
Jan. 2002	61	16	20
Feb. 2001	59	17	21
Mar. 2000	56	21	20

For 2005: "Did you happen to use the Internet yesterday?" was used for half the sample, and half the sample was asked the question below, used prior to January 2005.

Prior to 2005: "Did you happen to go online or check your e-mail yesterday?" was asked before place of use.

Source: Major Moments Survey, Pew Internet and American Life Project (see February–March 2005 questionnaire/topline), which includes results from previous years, available at ⟨http://www.pewinternet.org⟩.

tion technology has been offered by Paul DiMaggio and colleagues, who define the digital divide more broadly as "inequalities in access to the Internet, extent of use, knowledge of search strategies, quality of technical connections and social support, ability to evaluate the quality of information, and diversity of uses" (2001, 310).

According to the Pew Internet and American Life Project, Americans can be characterized as highly wired, tenuously connected, or truly disconnected. The "highly wired" (Fox 2005, 12) have high-speed broadband connections, which are associated with more frequent use and a greater range of online activities. In 2006, this amounted to 42 percent of Americans—close to the proportion who are daily users (Madden 2006).

There is other evidence demonstrating that occasional use is an insufficient measure of participation online. In an earlier study, James Katz and Ronald Rice (2002) identified about 10 percent of the U.S. population as

Internet dropouts. These former users often cited the lack of an Internet connection, a broken computer, changes in circumstances that made time for going online more difficult, frustration with the medium, or a decline in interest in the Web (Katz and Rice 2002, 75). Internet dropouts tend to be younger, lower income, and less educated than current Internet users. Like other nonusers, they have less income to devote to paying for Internet connections, and may have some skill deficits that make the Internet more frustrating and less relevant. Novices are most likely to express frustration with finding information on the Internet. Compared to experienced users, they travel the Internet aimlessly and often have negative reactions to their experience online in the absence of social support (DiMaggio et al. 2001).

Mark Warschauer (2003, 111–119) identifies a number of literacies associated with computer and Internet use, which he argues are necessary for social inclusion in the information age. Skills vary widely, including information literacy (the ability to find, evaluate, and use information online) and technical competence. The poor, the less educated, older individuals, African Americans, and Latinos are significantly less likely to report being able to find information online, controlling for other factors. These same groups are also the least likely to have the technical competence to use hardware and software. In 2001, 37 percent of the population said they needed help navigating the Internet. This may include some who can use the computer, but have difficulties searching for information (Mossberger, Tolbert, and Stansbury 2003, 45). One study of a hundred randomly recruited participants observed their ability to search online for information on jobs, political candidates, tax forms, and other topics. Fully 15 percent failed to complete three or more of the tasks, despite being given all the time they needed to find the information (Hargittai and Shafer 2006).

Increasing technology skill is clearly an educational issue for some as well as a matter of technical training or exposure to technology. The Internet is a reading-intensive medium, and many Web sites have challenging content. The average government Web site, for example, requires an eleventh-grade level of reading comprehension, even though about half of the U.S. population reads at an eighth-grade level or lower (West 2005, 54). A widely cited national study of literacy conducted in the

early 1990s concluded that between 21 and 23 percent of Americans function at the lowest level of literacy, barely able to do more than sign a form or read the most simple and brief of instructions. Another 20 percent have difficulty reading a few pages of text and comprehending them (Kaestle et al. 2001). Limited literacy may pose a substantial barrier to the further diffusion of Internet use or the effectiveness of some who do go online.

The importance of education is demonstrated by what Paul DiMaggio and Coral Celeste (2004) call the "deepening" of Internet use. The authors found that educational attainment is related to the amount of time that people spend online, and that it is a stronger predictor of Internet involvement in nonentertainment activities than variables such as race, ethnicity, or income. Controlling for other factors, education, years online, and youth are significantly associated with using the Internet to enhance human capital (visiting Web sites involving school, work, health, finances, or science) or social capital (visiting sites related to news, government, or politics). These findings are especially relevant for understanding the link between educational competencies and digital citizenship.

As the motivation to go online and physical access to the Internet become more widespread, disparities still remain in the frequency of use and digital skills, according to Jan Van Dijk (2005, 73). It is not only those who are "truly off-line" who are likely disadvantaged in terms of the ability to use technology effectively—to find information or have appropriate job skills. Those who drop out or have a tenuous connection to the Internet through others, or via infrequent use at public access sites, may also be among those left behind. These issues will be analyzed in more depth in chapter 5, where we examine the patterns and causes of inequality.

As subsequent chapters will show, the development of the Internet and the migration of more Americans online over the past decade represent significant social changes with many potential benefits. But in contrast to those who claim that the digital divide is disappearing over time, we see a substantial minority (up to half of the U.S. population) lagging behind in a society that is largely online and using technology in an expanding variety of pursuits.

Approach and Methods

This book examines information technology use by analyzing data from recent national opinion surveys conducted by the Pew Internet and American Life Project, the Pew Research Center for the People and the Press, the American National Election Studies (NES), and the U.S. Census Bureau/CPS. Individual chapters describe in greater detail the sources of the data and the methods used to analyze the data. A summary of methods is provided within each chapter, but with more technical details contained in separate sections in each chapter, so those wishing to skip this discussion may do so.

Many studies on the social impact of the Internet and the digital divide have relied on descriptive statistics, case studies, or other methods of analysis that lack multivariate controls to untangle the overlapping influences. These can be useful for understanding trends, as the summaries of the Pew surveys in this chapter showed. In the rest of the book, we use a number of multivariate methods that allow us to explore the causes of trends, including the relative importance of overlapping influences such as income and education. Understanding the role of the Internet in fostering civic and political participation also requires the use of methods that can better untangle cause and effect. A common problem in previous studies is that individuals who use online political information may be more interested in politics, younger, or different in some other ways due to self-selection. In the chapters on civic engagement and political participation, two-stage causal models are used to isolate cause and effect as well as remedy selection bias (or endogeneity problems). We also rely on a variety of advanced statistical methods.

For those who are familiar with multivariate methods, these include logistic regression (for binary outcome variables), ordinal logistic regression (for ordinal outcome variables), multinomial probit (for nominal outcome variables), Poisson regression (for count outcome variables), and calculations of the standard errors that correct for problems that can lead to biased estimates using robust standard errors. Depending on the coding of the dependent variables, these methods are used in models in various chapters. In our analysis of the large-sample CPS data, we use "subsample" analyses, predicting technology access or the frequency of Internet use for subsamples of the population, such as African Americans,

Latinos, the poor, or the less educated. These fine-grained analyses allow us to isolate the factors that encourage technology use for disadvantaged groups more accurately than standard statistical methods, and also provide controls for endogeneity and selection bias concerns.

Despite the advanced methods underlying the findings, we present the results in a format accessible to readers without a background in statistics. We will use "what matters" tables that list statistically significant factors along with probability simulations (or predicted values) that are as easy to understand as simple percentages, but that are based on the regression coefficients, and so show the relative size of the impact on outcomes. All multivariate regression tables will be included in an appendix for those who wish to examine our data and results in greater detail.

The Plan of the Book

Chapters 2 through 4 assess the benefits of inclusion in society online—how the Internet matters for economic advancement, civic engagement, and political participation. This constitutes the empirical evidence for digital citizenship as part of the liberal and republican traditions. In chapters 5 and 6, we analyze patterns of exclusion from society online and the extent to which they resemble ascriptive hierarchy. The conclusion evaluates digital citizenship and the costs of exclusion in light of the prior evidence and Smith's framework.

Chapter 2 examines the growing income inequality in the new economy and asks what role Internet use might play in economic opportunity, especially for less-educated workers, who are more likely to lack technology skills. Most research examining the effects of information technology use on wages predates the Internet and the widespread diffusion of technology in the workplace, and there is little national evidence on the impact of technology use for less-educated workers. Using the 2003 CPS as well as 2002 and 2005 Pew national opinion data, we examine the impact of Internet use at work on wages for all workers, and also for lower-skilled workers with a high school education or less. If technology use does indeed lead to increased economic opportunity, public policy based on expanding skills and the equality of opportunity is justified in the tradition of liberal individualism.

Few published studies have explored the effect of the Internet on civic engagement, which is essential to the republican tradition of citizenship. Those studies that do exist use older data or fail to analyze the impact of Internet use on varying forms of engagement simultaneously (Jennings and Zeitner 2003; Uslander 2004; Price and Cappella 2001; Kim et al. 2004; Shah, Kwak, and Holbert 2001). Does Internet use lead to a more informed, engaged, and politically interested electorate, contributing to civic republicanism? Drawing on recent research, we hypothesize in chapter 3 that the Internet may be a new stimulus for political knowledge, interest, and discussion.

Chapter 4 takes a further step, asking whether varied uses of the Internet increase political participation. Just as Jefferson and others have championed education for its potential to enhance civic and political knowledge, interest, and participation, public policy to expand technology access may be justified on similar grounds. While earlier research has found that the use of the Internet increases voting and political participation (Bimber 2003; Tolbert and McNeal 2003), no published research has explored the influence of varying forms of Internet use (e-mail, chat rooms, and online news) on political participation. We also compare the effects of the Internet to other media.

Chapter 5 offers new evidence to define digital citizenship (daily Internet use) using the 2003 large-sample CPS conducted by the U.S. Census Bureau. Using multivariate statistical methods (logistic and ordered logistic regression) and a sample population of over one hundred thousand U.S. adults, we present models for home Internet access and use. Most important, we determine the factors leading to digital citizenship or daily Internet use. Given the large sample sizes, we are able to conduct subsample analyses predicting access and use for the poor, the less educated (high school degree or less), racial minorities (African Americans and Latinos), and older and younger samples of the population. Our analysis of younger respondents, in particular, suggests implications for the future.

A new dimension of technology inequality is broadband or high-speed access, which is examined in chapter 6. Broadband users are those with digital subscriber lines (DSL), cable modems, wireless connections, or fiber (T-1) connections, and as of 2006, 42 percent of Americans had high-speed access (Horrigan 2006). We analyze patterns of broadband

adoption and ask whether broadband use may encourage skill development and the migration of daily tasks online. Although broadband access has now become more widespread, there are marked disparities in rural areas, and other gaps in broadband access and use are clearly related to social factors rather than infrastructure.

Chapter 7 ties together the previous evidence by discussing the costs and causes of exclusion from digital citizenship. The conclusion also presents a claim for policy attention to technology, and recommends federal and subnational policy to create universal access and equal educational opportunity.