Globalization, Information Technology, and Conflict in the Second and Third Worlds

A Critical Review of the Literature

PROJECT ON WORLD SECURITY
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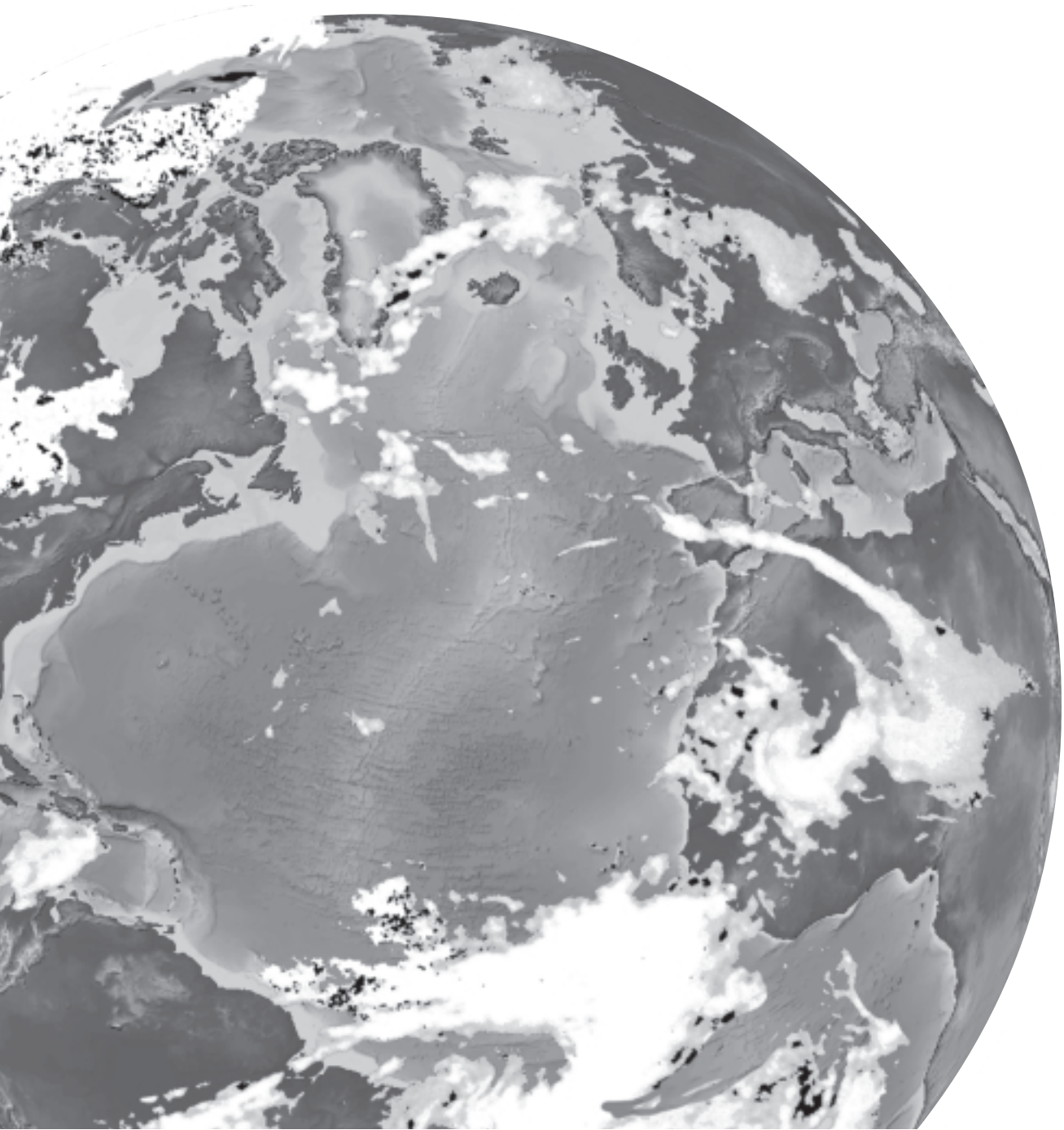
Ernest J. Wilson III



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INTRODUCTION

There are several trends abroad in the world that are important for the position of the United States in the international system at the end of this millennium. First, the press reports daily on an expansion of societal conflicts in developing and post-Communist societies in Asia, Africa, and Central Europe. Many seem to be violent, often vicious, struggles over the most fundamental identities: the politics of religion, of race, of ethnicity, of neighborhood. Bosnia, Burundi, Israel, and Liberia are the avatars of this trend.

A second apparent trend is globalization. Scholars and journalists have flagged as critical the globalization of finance, the globalization of manufacturing, the globalization of culture. One trillion dollars moves daily around the world, and automobiles we buy in Philadelphia may be assembled in Taiwan with parts made in five other nations. Local unemployment seems to have global roots, and political protests in Sinai and Somalia seem targeted as much for Washington's television screens as for local leaders.

A third trend is the Information Revolution. Around the world today we see the growing sophistication and rapid international diffusion of powerful new Information Technologies (IT), the mergers of huge communications empires, strategic alliances across borders, and the doubling of power and the halving of the price of computing every eighteen months (i.e., Moore's Law).

The Information Revolution, ethnopolitical conflicts, globalization— each of these three mega-trends is individually important for the future of the United States and indeed the world. Together, they are redefining the global context within which American government and American citizens must make daily decisions in the years to come. Thus, their intersection should constitute a central concern of scholars, policy makers, and American citizens. This intersection is the subject of this essay. Specifically, we ask: "What is the impact of globalized information and communications technology and services on the politics and society of developing countries, especially on the issues of conflict and cooperation?"

This is admittedly a huge and unwieldy question, and to answer it, we have carefully examined a wide range of literatures across a variety of research fields, scholarly disciplines, and geographic areas of the world. We personally contacted scholars and research units on several continents in search of annotated or critical bibliographies on IT and society. We were disappointed to discover how modest was the literature that actually analyzed these issues carefully and sought to measure their impacts. Regrettably, there are barely a handful of bibliographies of any kind (Marien 1996). In response to this gap, this essay concentrates on defining and identifying IT's societal impacts, and thus is one of the first such bibliographic essays on that subject. It is intended to help others work their way through this burgeoning and important area by providing a bird's-eye view of the critical themes within, and links across, various IT-related literatures.

As a way to organize these findings, I reach five general conclusions; three were expected and two unexpected. *First*, our review of the scientific literature indicates that IT has less impact on less-developed-country societies than is often claimed by IT enthusiasts and partisans. Much of the language in the literatures uses the future and conditional tenses: will, may, should. Thus, the literature presages the impact of IT, rather than demonstrating its present influence. Our *second* finding is that where IT has had societal impacts they may be both positive and negative; and highly situation-specific. The acceptance or rejection of IT will be shaped by local cultural values through which winners and losers filter their realities and their evaluation of IT's impacts. The *third* conclusion states that society dominates IT, and not vice versa. IT is not a disembodied force, autonomous and above society, but a tool wielded on behalf of a particular group, whose availability and disposition are dictated by the distribution of power and wealth of a given society.

These three general findings answered questions with which we began our study. We also encountered answers to questions we had not originally posed. The first unexpected finding of this review is the differentiation between "IT-as-media" and "IT-as-embedded-factor-of-production"— and the fact that "IT-as-embedded-factor-of-production" seems to have a far greater impact. The dramatic and ever-increasing information-processing power of the computer chip continues to affect critical economic decisions like cross-national investment, job creation, and innovation — decisions that are reshaping employment levels, social structure and, ultimately, political behavior. The TV tube and Hollywood movies will probably have less impact in their sphere over the long term than the modest computer chip's capacity to change the organization and location of work. The second unexpected conclusion is the high degree of agreement in the literature that the globalization of IT has slowly eroded the sovereignty of the state. This, in turn, reflects the slowly increasing openness of a global society wherein actors at the sub-national level are using IT to gain increased access to political resources formerly exclusive to the state.

DEFINITIONS

"Information Technology" is shorthand for information and communications technology and services. Too often, the "technology" aspect is overemphasized at the expense of the "services"; most users are not interested in the technology as such, but only in the benefits and services it can bring. Information Technology encompasses the full range of the production, distribution, and consumption of information, across all media from radio and television to satellites and the Internet. References to the "Information Revolution" reflect the rapid advance in the power and speed of computers, the digitalization of information, and the convergence of once-separate industries into a new amalgam of production, distribution, and consumption activities. Made possible by the shift from analog to digital technologies (a shift toward messages encoded in a series of '0's and '1's), convergence merges computers, telecommunications, television, and the Internet into a single multimedia environment. These are typically accompanied by important organizational and commercial changes as well. Information Technology and the IT Revolution refer not only to traditional communications functions, but also to the steady introduction of computer technology (such as chips) into nearly every sector and activity, from health to transport to education.

"Globalization" refers to quantitative and qualitative expansions in transborder flows of activities and ideas. These include financial flows, such as the one trillion dollars of finance capital that circulates daily; or cultural ones. Some argue that globalization represents a qualitative step away from earlier trends like "internationalization"; others use the term to contrast bilateral state-to-state flows with system-wide dynamics like environmental changes. The term also can indicate the simultaneous pressures on national-level decision-making created from "bottom up" populist and participatory pressures on the one hand, and "top down" transborder challenges on the other. Others use the term simply as an updated synonym for internationalization.

In this review, the "globalization of IT" is used to convey at least two dimensions: cross-border flows of information content such as movies, CDs, radio broadcasts, videotapes, and so on; and the cross-border spread of the actual hardware used nationally and locally to produce, distribute, and consume information. Thus, the literature addresses the globalization of both content and hardware.

There is an additional conceptual issue which has emerged from our analysis. A substantial barrier to clarity occurs because authors often fail to distinguish among three distinct and separate aspects of Information Technology. They are: "IT-as-media"; "IT-as-embedded-factor-of-production"; and "IT-as-driver-of-organizational-change."

By "IT-as-media" we mean IT as content. Analysts assume that broadcast and printed messages and programs carry implicit as well as explicit values, and the analyst's task is to tease out the meaning of the implicit content, including the cultural, political, and other values assumed to be embedded therein. Once the analyst identifies the implicit values, he or she traces their distribution to an audience. For many, that is sufficient to show impact. More sophisticated analysts try to determine whether the content was received by the viewer or listener, how it was evaluated, and whether it changed their attitudes or behaviors. Such content flows are important because they can potentially affect ethnic or class relations, creating tensions or cooperation.

Quite distinct from "IT-as-media" is "IT-as-embedded-factor-of-production." This defines IT as similar to land, labor, and capital as a critical ingredient to be combined with others to create economic production and growth. The impact mechanism here occurs as IT restructures the resources to which different individuals and groups in the society have access, including access to employment and capital. The literature on telecommunication's impact on developing society is an example of this approach.

The third distinctive aspect is "IT-as-a-driver-of-organizational-change." It is this aspect of communications across and within hierarchies that leads to the flattening-out of organizations, whether in the public, private, or non-governmental-organization sectors.

While we return to these three distinctions in our discussion of the texts and in the conclusion, it is important to keep them in mind from the beginning and to recognize that they operate through different mechanisms and should not be confused with one another.

COMMON THEMES IN A BALKANIZED LITERATURE

Despite this wide diversity of literatures, our mapping exercise has nonetheless identified several general questions that cut through them all.

One theme hinges on whether IT or "society" most shapes outcomes where they intersect. The "IT-First" group defines IT as the independent variable that shapes subsequent societal actions, attitudes, processes, and structures. Under this perspective, for example, introducing computer technology into a country or organization will reshape social hierarchy and political relations. The opposite view posits "Society-First." It insists vigorously that the structures and processes of society invariably determine technological outcomes.

A second difference among analysts is whether IT affects society deeply and broadly, as Toffler insists, or whether the impacts are narrow, shallow, and short-term. In other words, are the impacts significant or small?

A third split occurs over the whether the impacts are judged to be positive or negative. The more optimistic authors, such as George Gilder, believe that IT's impacts will almost always be positive. Another group of writers is more pessimistic, and warns the reader of buying "Silicon snake oil" (Stoll 1995).

These splits in the literature on IT are not unique to debates over IT. One of the most concise and insightful discussions of these distinctions is expressed by Emmanuel G. Mesthene in his essays written in the l960s. Leader of a technology group at Harvard University, he identified what he called "three unhelpful views about technology." "First is the view that technology is an unalloyed blessing for man and society. Technology is seen as a motor of all progress, as holding the solution to most of our social problems, as helping to liberate the individual from the clutches of a complex and highly organized society, as the source of permanent prosperity; in short, as the promise of utopia in our time" (Mesthene 1996, p. 72).

He contrasts the "unalloyed blessing" view with the second, less sanguine, view "that technology is an unmitigated curse…said to rob people of their jobs, their privacy, their participation in democratic government, and even, in the end, their dignity as human beings. It is seen as autonomous and uncontrollable, as fostering materialistic values and as destructive of religion, as bringing about a technocratic society and bureaucratic state in which the individual is increasingly submerged" (p. 72).

The third school under the aegis of IT "argues that technology as such is not worthy of special note, because it has been well recognized as a factor in social change at least since the Industrial Revolution; because it is unlikely that the social effects of computers will be nearly so traumatic as the introduction of the factory system in 18th century England; [and] because research has shown that technology has done little to accelerate the rate of economic productivity since the 1880s" (p. 73).

Ultimately, Mesthene concludes that all three views are too simplistic and dichotomous. Instead, he poses a more sophisticated and nuanced understanding of the relations between IT and conflict and democracy in developing and transitional

societies: "New technology creates new opportunities for men and societies, and it also generates new problems for them. It has both positive and negative effects, and it usually has the two at the same time and in virtue of each other" (p. 76). These same salutary and skeptical views are expressed on IT matters by authors like Barber, by Burstein and Kline, and others as we see below.

INFORMATION TECHNOLOGY AND DEVELOPING SOCIETIES: OVERVIEW

A recent text on globalization and IT suggests that the current "information revolution" will have a "greater and qualitatively different" impact than any previous phenomenon (Kahin and Nesson 1997, preface). Yet, there is scant consensus in the literature on IT globalization and its impact on developing states. Even in a highly developed industrialized country like the United States, which is both saturated with new IT and replete with statistical, empirical, and anecdotal evidence, there is surprisingly little consensus among experts on the impact of IT. For example, despite years of research and mounds of evidence, there is no single consensus on what effect viewing television violence has on aggressive behavior in American children (Lowery and DeFleur 1995, p. 340). Beyond opinion and interpretation, causal relationships have been neither adequately specified nor understood to support a wide professional consensus about when, how, and under what conditions viewing television violence leads to violent behavior in American children. Thus, it should not be surprising that research on the spread of IT across the entire globe yields very few firm conclusions on the impact of IT on inter-state or intra-state relations. Also, there have been few, if any, large-scale, cross-national research projects using social science research methods to try to measure IT impacts systematically (Wilson 1996a; Wilson 1996b).

INFORMATION TECHNOLOGY AND THE DEMOCRATIC AND AUTHORITARIAN BALANCE

One of the biggest unknowns and one of the greatest concerns is whether IT enhances or eviscerates democracy. Writers like Toffler believe that the "Third Wave" Information Revolution brings widened and positive potentials for citizens to be interconnected to one another and to their government (Toffler 1980). For developing countries especially, where the hidden hand of corruption and manipulation is so corrosive, some argue the Information Revolution can make government internal processes more transparent to the citizenry (Talero 1997). According to Marien, the "Magna Carta for the Knowledge Age," a political tract about the potential benefits of direct democracy and reduced state interference facilitated by the Information Revolution, is a powerful conceptualization of the issue (Marien 1996; Dyson 1995).

A classic statement of this optimistic school appeared in that fount of cyber-optimism, *Wired* magazine. In an intriguing piece, "The Netizen: Birth of a Digital Nation," Jon Katz assembles most of the shibboleths of political optimism. It is worthwhile quoting it at length:

> Where our existing information systems seek to choke the flow of information through taboos, costs, and restrictions, the new digital world celebrates the right of the individual to speak and be heard — one of the cornerstones behind…democracy. Where our existing political institutions are viewed as remote and unresponsive, this online culture offers the means for individuals to have a genuine say in the decisions that affect their lives.

> Where conventional politics is suffused with ideology, the digital world is obsessed with facts. Where our current political system is irrational, awash in hypocritical god-and-values talk, the Digital Nation points the way toward a more rational, less dogmatic approach to politics. The world's information is being liberated, and so, as a consequence, are we (Katz 1995, p. 50).

Some writers concentrate on the more technical capacities of electronic tools to enhance direct democracy. Electronic town meetings are now possible and desirable (Snider 1994), and as Slaton describes, "Televote" experiments promote more citizen participation in government (Slaton 1992).

Similarly, the "modernization" school of social science writers sees wider exposure to all forms of media, including newspapers and radio, as an inevitable accompaniment and contributor to political development. Certainly, cross-national studies that seek correlations between democracy, media availability, and media diversity have generally found fairly direct positive associations (Lerner 1958). Counterpoised are pessimistic arguments in the Orwellian vein. Central government's continuing controls of the public media in some Central and Eastern European countries perpetuate the conditions for the Big Lie of political propaganda. This has been a major concern of the demonstrators in Bosnia. Big Brother can still watch his charges, even with the demise of communism.

In an explicit counterpoint to *1984*, Gilder says Orwell was wrong (Gilder 1989). The distributed nature of the computer revolution can put powerful communications tools in the hands of all citizens, and the little screen trumps the big one. Optimists also believe that increased IT penetration will make it more difficult for abusive, authoritarian, and quasi-sovereign governments to maintain their legitimacy (Pool 1990; Frederick 1991; Ganley 1992; Ganley and Ganley 1987). Information Technology and increasing communications networks are described as avenues to greater public awareness about and participation in public policy debates. Greater access to IT may also permit greater popular knowledge about power struggles within government (Pool 1990; Hanna and Boyson 1991; O'Neill 1993; Ash 1990; Banks et al. 1992; Annis 1990; Zimmer 1990).

Skeptics question the impact of any of these influences. They argue that the influence of IT, particularly in regard to popular leverage on governments, is overestimated (Marvin 1988; Cary 1989; Neuman 1996). Skeptics also point out that both state-controlled and privately held mass media can be used to serve up propaganda to the public and to manipulate political values which enhance regime support and political legitimacy (Fox 1994; Toffler 1991; Barber 1996).

Pessimistic and radical authors also point out that IT has been used to undermine the popularity of both "good" and "bad" government programs, democratic and authoritarian alike. Skeptics suggest that IT can facilitate the destabilization of regimes disliked by foreign interests who portray a national government as incompetent, corrupt, and odious. This type of surreptitious influence was a primary concern of the movement for a New World Information and Communication Order (UNESCO 1984; Webster 1984).

Because the writings of optimists tend to outnumber those of the critics and pessimists, it is worth balancing the optimism by citing at length from Marien's

excellent review essay. He notes that many authors are concerned about the problems of "information overload or infoglut" (Ellul 1990; Postman 1992; Roszak 1986) and then identifies a long list of concerns critics hold about the negative impacts that IT can have on societies, including: loss of community; networks as isolating (Stoll 1995; Birkerts 1994; Slouka 1995); cyber-authoritarianism (Kroker and Weinstein 1994); literacy and creativity diminished (Stoll 1995; Birkerts 1994); reduced attention span (Birkerts 1994); undermining humanity and morals (Postman 1992); unemployment (Webster and Robins 1986; Coates 1995); rich/poor gap aggravated (Stoll 1995; Haywood 1995); and information commodified (Haywood 1995).

Especially nuanced appraisals of democracy and IT are provided by writers like Barber and Ronfeldt. The popular media may give the appearance of greater access to "news," but news itself is too often corrupted into "infotainment" (Barber 1996). Further, IT may buttress both totalitarianism and democracy, the centrifugal and the centripetal, the spinning apart of radical nativist "Jihads" and the homogenizing cosmopolitanism of "McWorld." "[C]yberocracy, far from favoring democracy or totalitarianism, may make possible still more advanced, more opposite and farther apart forms of both" (Ronfeldt and Arquilla 1993). These careful analyses, recognizing the utopian and the dystopian possibilities, provide the greatest insight into the multiple intersections of IT and politics.

Democracy can be affected by the direction of information's flow. While most scholarly and policy attention is on the global flow of information *into* countries, one can also analyze information flows in the other direction. Some analysts argue that increased information out-flow makes it more difficult for governments to hide and distract external audiences from issues which may erode their regimes' legitimacy and authority. The reasoning is that new IT can hinder government officials' ability to control which information leaves their countries. If a regime is unable to control the outflow of information that is potentially damning, it can lead to an increase in external support for opposition groups and result in more foreign pressure for the government to change (Annis 1991; Livernash 1993; Ganley 1992; Perry 1992). Yet skeptics note that governments can exploit those same technological channels with carefully tailored pro-government propaganda, preying upon the news media's desire for highly symbolic stories, such as the release of a political prisoner (Brysk 1993).

Another theme is whether IT tends to centralize and concentrate power, or to decentralize and redistribute it, not only within the formal political system, but more broadly in the society at large. Information Technology may intersect with other global trends that appear to redistribute power and influence "downward" to non-governmental organizations, businesses, and other social associations. Views range from those who see decentralization as inevitable and good, to others who see advantages in centralization (Mathews 1997).

Barber points out once again the double-edged character of the globalization of technologies. "Telecommunications [or other] technology has the capability for strengthening civil society, but it also has a capacity for unprecedented surveillance and can be used to impede and manipulate as well to access information" (Barber 1996, p. 270).

Those who welcome decentralization offer a multifaceted argument. Some, such as Bell (1989), Toffler (1991), Nora and Minc (1980), and Rosenau (1990), argue that new technologies have been a force for decentralization that results in empowerment of individuals. There is strong consensus throughout the literature that these new technologies have very important consequences for the capacities of non-governmental organizations to be better organized internally (Weyker 1995), to communicate better between themselves, and to gain influence vis-à-vis the power of the state.

Others see centralization as troubling and are concerned about the political implications of concentrated control of politics and of economic production (Noble 1984; Kumar 1978; Gandy 1989; K. Wilson 1988). For example, this group believes that using new trade-facilitating IT will undermine local elites and local traders at the expense of better connected national elites and urban traders. Greater IT penetration into remote areas may also promote commercial ventures which, in turn, will inflict greater environmental damage (Annis 1992).

One current trend in developing areas like Africa and Latin America is to break government broadcast monopolies by opening them up to private ownership (E. Wilson 1996). While generally a progressive step, private ownership by itself is not a guarantee of content diversity if broadcasting switches from being a public to a private monopoly. Hence the call for greater competition.

Some argue strongly that democracy will be enhanced because newer technologies like the Internet and satellites have a greater capacity to circumvent the official filters that public or private powers try to place between their citizens and news sources (Gilder 1989).

Kedzie offers a thoughtful treatment of the interplay between information and communication technology and democracy in his essay, "The Third Waves." He notes that both Huntington and Toffler employ the term "third wave" in their classic books: the former's work on the latest surge of democracy, *The Third Wave: Democratization in the Late Twentieth Century* (1991); and the societal transformations of Toffler's *The Third Wave* (1980). Kedzie notes that the titles are probably coincidental, but the concepts may be positively correlated. He quotes M.I.T.'s Eugene Skolnikoff, who writes:

> It is therefore a reasonable, though qualitative, conclusion that the introduction of information technologies (and other technologies that play a synergistic role) tends, on balance, to have consequences that are biased in the direction of increased limitations on the centralization of political power and toward greater openness in society (Kedzie 1997, p. 107).

He quotes President Bill Clinton making a similar argument: "Revolutions [in] information and communication and technology and production, all these things make democracy more likely" (p. 108).

Kedzie then tries to test this democratic-IT hypothesis by matching Internet expansion with democracy. He concludes unambiguously: "empirical evidence confirms a postulated correlation between Huntington's and Toffler's 'Third Wave' phenomena. Despite the inherent limitations of statistical analyses, every perspective, every model, and every set of statistical texts in this study consistently verify that

interconnectivity is a powerful predictor of democracy, more so than any of democracy's traditional correlates. As a single independent variable, interconnectivity more strongly correlates with democracy than any other variable" (Kedzie 1997, pp. 124–25). While he recognizes causality cannot be claimed conclusively, he does believe the correlation is important for understanding the IT-democracy link and for scholarship and public policy.

Thus, IT seems to affect democracy and bottom-up political expressions in a variety of ways. In summary, new IT seems to:

- multiply the channels through which groups can express themselves (faxes, E-mail, etc.);
- evade government controls;
- promote competition among different channels;
- encourage the easier and cheaper creation of content which can be produced by local or grass roots groups; and
- permit linkages among geographically separated groups that may share a common political ideal, objective, or interest.

The upshot of all these trends is as Skolnikoff suggests, to expand the opportunities for democratic political action. Still, while logically argued and appealing, this assertion has not been conclusively demonstrated empirically.

INFORMATION TECHNOLOGY AND CONFLICT

Does the Information Revolution in developing and post-Communist societies serve to push society together or pull it apart? Two types of conflict are especially relevant to developing societies, and we find them discussed amply in the literatures. One is conflict rooted in differences in race, religion, and ethnicity; the other is conflict rooted in differences of economic or class status.

ETHNIC CONFLICT

The apparent spread of ethnopolitical conflict during a time of media globalization has led some to suggest a causal relationship between the two. A seemingly clear impact of IT on violence was seen in two of the most vicious and violent of the recent post-Cold War ethnic clashes: Rwanda and Bosnia. Information Technology was used in both cases intentionally to disseminate hate propaganda designed either to cause or sustain genocide (Article 19, 1994; Duffield 1994). The government controlled by chauvinist Hutu elites in Rwanda used the state radio to urge Hutu militants to attack "enemies" of the regime, especially ethnic Tutsi, but also other Hutus who urged moderation. Okere (1996) argues that the creation of heavily censored, government-controlled domestic mass media, which never reports anti-government criticisms and protests, does nothing to defuse, and instead likely heightens political tensions between governments and those they define as their enemies. Minear and his co-authors carefully studied humanitarian interventions in Africa and reached similar conclusions about the media's role. Since many in the West now recognize the negative role of media in fomenting ethnic violence, they have taken serious steps to use media to counter and decelerate violence (Minear et al. 1996).

Another important impact of IT is when media coverage encourages conflict escalation. Participants, as a result of media coverage, escalate their conflictive behavior in order to influence other states to increase support for them and undermine their opposition (Giradet 1995; Article 19, 1994). The U.S. Institute of Peace addresses these issues in their work on humanitarian crises and the media in Africa (USIP 1996). Toffler and Toffler (1993) suggest that the influence of national governments' use of domestic media to incite genocidal violence against rival ethnic groups may be mitigated by external programs such as those aired by BBC, ABC, and CNN.

FOREIGN AUDIENCE DEMANDS

An important, but sometimes overlooked, implication of IT and Third World conflict is how "instant news" and external audience demands for instant news can influence internal dynamics in developing countries. For example, during the run-up to the U.S.'s Haitian intervention, television reporters in Haiti and their producers demanded on-the-spot interviews. Yet, initially they could only interview pro-government Haitians because others were too fearful to talk to the press (Minear et al. 1996); thereby, a bias about popular support for the regime was introduced. This bias may have made the

Haitian regime more recalcitrant to negotiate with the United States by increasing its confidence in its ability to sustain external support and withstand a U.S. invasion.

Similarly, there may have been biased reporting of the Rwanda story, due to the difficulty of reporting on genocide and the comparative ease of reporting refugee migration. The danger to reporters in reporting on the genocide as it unfolded, and the relative ease and safety of reporting on the conditions of Hutu refugees fleeing the genocide, led analysts like Minear (1996) to conclude that the focus of attention on the Hutu refugees and the underreporting on genocide resulted in a sub-optimal aid response that favored food and medicine to the refugees at the expense of the genocide victims. For example, the media's emphasis on the dramatic and photographic aspects of the refugee story contributed to excess food-distribution aid at the expense of desperately needed sanitation systems for dealing with the cholera outbreak. Michel (1994) writes that this media bias in turn skewed aid, because non-governmental organizations looking for media exposure for funding opportunities fought to be in front of cameras focused on starving children. Duffield (1994) and Rotberg and Weiss (1996) similarly point out that audience demands for television coverage of human misery can result in heightened levels of aid, which in turn decreases the incentives for parties in conflict to resolve those conflicts as an alternative means to secure more aid. Livingston and Eachus (1995) argue that media interests are not apolitical, since international television editors take their cues from Western policy-makers and do not cover brewing crises unless the policy-makers encourage them in that direction. Clearly there are many intervening steps, but the media seem to play an important role in these cases. Perhaps the greatest role for this kind of foreign reporting is to create a greater sense of humanitarian obligation by citizens in developed countries.

The editor of *Foreign Affairs* makes a parallel point when he admits that the media in the United States and other developed countries can shape the policy debate, but he insists that this mainly occurs when an administration fails to provide neither the necessary leadership in foreign policy nor the political framework citizens need to evaluate news reporting that is often too sensationalist and superficial (Hoge 1994).

Broadening the issue to consider "IT-as-embedded-factor-of-production," and its impact on ethnic conflict, makes the picture more complex. For example, if capital investment for telecommunications or information processing flows to some national sub-regions more than others, it is likely to impact differently on different ethnic groups. New IT investments could thereby favor groups already possessing good technical skills and higher education, and undercut others less well placed. This may unintentionally reshape political relations among ethnic groups and exacerbate class relations.

CLASS CONFLICT

Ethnic conflicts are not the only ones that may be eased or aggravated by new patterns of communications. Class divisions may be affected as well. The impacts of IT on class relations in developing countries are likely to be significant, but quite indirect. These impacts may be felt through any of the channels we discussed earlier: IT-as-media, IT-as-economic-factor, or IT-as-driver-of-organizational-change.

In considering IT-as-a-factor-of-production, for example, some analysts worry that the proliferation of modern IT, including computers, better telecommunications services, and access to satellite dishes, will result in heightened divisions between the *haves* and *have nots* in the developing world. Several hypotheses emerge in the relevant literatures: one is that the *have–have nots* gap is widening as the *haves*, who are more educated and more IT-literate and "wired," leverage their ever-increasing information and knowledge into more control, wealth, and power. Evidence from the United States cited by former Labor Secretary Robert Reich suggests that with the increase of IT use throughout the economy, the demand for skilled labor (i.e., for those who can manipulate symbols) grows, while demand for unskilled labor falls substantially. As the gap grows between the highly educated and the uneducated, so does the likelihood of social conflict. To the degree that IT does "hollow out" and downsize companies, reduce the earnings of the less educated poor, and enhance the wealth of the highly educated and technically literate rich, we can anticipate some indirect impact of IT on social conflict. This is probably the most persuasive argument about the impact of IT on economic stratification and conflict. Other arguments about IT-as-media are important but secondary, as we discuss below.

There is little evidence in developed or developing countries of IT's direct impact on the scale and intensity of class violence. (It is difficult of course to discern the relative shares of downsizing [or, in other sectors, 'upsizing'] contributed by technology, and the shares contributed by other factors like international trade.) The extensive work on telephony's impact on less-developed countries rarely if ever addresses the issue of the telephone's impact on the social contract.

Let us turn to hypotheses derived from the IT-as-media approach. Some analysts hypothesize, for example, that many poor people will watch media programs and advertisements depicting lifestyles that their low incomes will not permit, and reason that the poor will demand their governments provide them with that higher standard of living. An icon of this type of programming is "Lifestyles of the Rich and Famous." This discontent, both economic and political, may then increase the conflict between economic classes.

Another set of analysts hypothesizes that underprivileged individuals exposed to such materialistic programming and advertising in developing countries will eschew traditional foods and products that are healthy. Instead, they would spend their meager resources on non-productive, affordable, but unnecessary consumption goods, such as Nestlé powdered infant formula and Coca-Cola. Vilanilam (1989) reports that some fathers in rural Mexico consistently sell off chickens and eggs needed to nourish their children in order to buy the Coca-Cola seen in advertisements.

Three other possible effects of advertising can be identified. One is the accelerated migration of poor rural laborers to urban areas, looking to acquire lifestyles portrayed in the media. This migration aggravates urban overcrowding problems and cuts migrants off from the communal resources and support of village life. These new urban immigrants are then available to join anti-establishment movements. This is one justification for designing and providing telecenters to rural areas in order to slow urban migration.

A second effect of IT-as-media may occur through its fascination with upscale urban and modern lifestyles, which may in turn desensitize political elites to the plight of the poor and the risks of rapidly growing economic disparities between themselves and the rest of the population (Vilanilam 1989). Finally, one thesis proposes that poor people who cannot afford advertised goods will see them as a symbol of the inequitable society and government in which they live and will reject them. This parallels the position taken by Barber in *Jihad vs. McWorld* (1996), which perceives radical opposition movements ("Jihad") as partly a reaction to exposure to amoral consumerism that he claims offends many audiences' traditional sensibilities. As anomie grows and frustration sets in, groups may revolt.

While Barber does not employ cross-national, social science survey techniques for his conclusions, his reasoning and the evidence presented do draw important distinctions between all modern IT, and the more specific *content* that flows through the IT pipes. Here it is sometimes useful to distinguish among Westernization, Americanization, and modernization (Barber 1996).

Aside from the possibility of worsening social and class conflict, there are some arguments that assert IT can mitigate conflicts rooted in economic disparity. Barber's *Jihad vs. McWorld* dialectic suggests that when traditional communal-based identity is replaced with that of a consumer, the consumer may be less likely to support conflicts over politics, economics, religion, or ethnicity. This logic parallels the early modernization school, but it recognizes the capacities for violence along the way and the possibility that full civic integration and democracy are not inevitable (Barber 1996). Toffler (1991) suggests that one of the most direct uses of media positively to impact change is when it counteracts hate propaganda. Human rights networks are also developing explicit programs to use old and new media to reduce violence and manage conflict.

Here again we conclude that IT-as-media should be viewed as a *neutral instrument* in conflicts or potential conflict situations. Media is neither inevitably conflictive nor invariably cooperative. Its impact depends on content, context, and especially on the purposes and aims of those who control them. For example, where one ethnic group seeks domination over another in multiethnic societies, they are likely to use media as one tool among several to effect this domination, as has occurred in Rwanda. However, their opponents are also likely to use their own media to resist domination and control. The direct impact of IT-as-media on social conflict will probably be less than the impact of IT-as-productive-factor.

Thus far we have traced the causal links starting with technology, trying to trace its impact on society, and then evaluating the links. Our conclusion is that the evidence of consistent impact is both modest and contradictory. This should be enough to conclude that IT does not on its own exacerbate conflict in less-developed countries. It is one of many factors that may, under specified circumstances, advance cooperation or conflict. But those conditions need to be specified.

Let us conduct a thought experiment that reverses the pattern of explanation. We begin with a plausible list of the some post-Cold War situations of domestic conflict and violence in less-developed countries or post-Communist regimes — this list might include Haiti, Bosnia, Rwanda, Tiananmen, Nagorno-Karabakh, East Timor. Can

we say that IT played a decisive role in these events? Would they have occurred without the media? In some of these cases, the media were important in terms of the responses of the outside world to the domestic conflicts; it is unlikely that the U.S. response to Somalia or Haiti would have been the same without the pictures of extreme deprivation and violence. Yet despite the extensive coverage in Bosnia, it was not enough to force outside intervention — once again clear causal patterns do not emerge.

INFORMATION TECHNOLOGY, CONFLICT MANAGEMENT, AND HUMAN RIGHTS

PROTECTION AND DOCUMENTATION

The flip side of IT-as-an-instrument-of-conflict is IT-as-a-conscious-instrument-of-cooperation. Examples of conflict-mitigating impacts can be found in Teer (1975) and Myrdal (1970) who view IT as a potential facilitator of democratic values. Dickerson (1977), Rizzoni (1976), and Mgaya (1978) argue that IT is an essential component of successful economic development, and McAnany (1980) and Hornick (1980) see IT as an essential component for socioeconomic development.

More pointedly, there are examples of IT used explicitly to manage or reduce political tensions. Relevant and interesting here is the substantial work published by non-governmental organizations at the intersection of democracy, human rights, and IT. One such group is the Canada-U.S. Human Rights Information and Documentation Network (CUSHRID). CUSHRID Net was founded to address the need for "accurate, credible and timely human rights information and documentation" (Girouard 1996, p. 1). Its conferences draw participants from all the continents, from countries like South Africa, Mexico, and China. Its goals are:

- To strengthen the human rights community by facilitating the exchange of ideas and information between individuals and organizations who are engaged in human rights documentation and information work, as well as to provide a forum for the sharing of information;
- To establish uniform standards for human rights documentation, information management, and exchange;
- To develop collaborative projects in the area of documentation and information management and foster a division of labor that avoids unnecessary duplication of work;
- To establish a resource network for assistance and training in various aspects of documentation and information management; and
- To promote cooperation and exchange of information and documentation among human rights groups, documentation centers and resource facilities within North America and with networks in other parts of the world (Girouard 1996, p. 1).

Concretely, for example, Amnesty International has begun to emphasize electronic communication and information-sharing by establishing Internet gateways for its field offices, and ties to other organizations, as well as a Web site. Amnesty, like other organizations, is also engaged in training programs with other non-governmental organizations to improve their use of the technology; they are also engaged in information-sharing on potential abuses in particular countries, and on strategies to document and archive human rights conventions, treaties, and so forth. (Girouard 1996, p. 22). For example, the Asian Forum has published the *Handbook on Fact Finding and Documentation of Human Rights Violations*. This will facilitate the capacity of groups to build cases against governments that abrogate human rights.

INFORMATION TECHNOLOGY AND ECONOMIC DEVELOPMENT

One of the greatest determinants of the location, character, and content of conflict in less-developed countries is the structure of the economy. Whether an economy is mainly agricultural or highly industrialized; whether mining or services dominate; or whether the Gross Domestic Product (GDP) per capita is high or low substantially affects the patterns of political alliance and opposition. The nature of political conflict in highly industrialized economies with well-organized unions, diversified production, and a substantial service sector is usually quite different from conflicts in largely agricultural economies. Therefore, to the degree that IT shapes and reshapes the structure of the economy, it also will shape the broad lines of social conflict.

One should not conclude that there is any simple relationship between development, IT, and conflict, such as more development–less conflict. The process of development itself can increase conflict. Competition over valuable resources generated through rapidly rising growth has generated conflict over who will control or consume those new resources.

There is also contrary evidence showing conflict, competition, and violence during declining growth. Nelson (1998) writes of these contrary findings in her recent paper. It is certainly the case, however, that the main drivers of growth (and decline) will shape both conflict and cooperation in decisive ways—growth based mainly in agricultural production will show different patterns of conflict than growth mainly through manufacturing. As industrialization fueled conflict/cooperation in the past, it appears that the social structural changes engendered by the Information Revolution will create their own patterns of winners and losers with new patterns of cooperation and conflict in the future (Burstein and Kline 1995), perhaps between information workers and non-information workers.

It is not surprising, therefore, that interest is growing in IT and its impact on economic, social, and political development in poor countries. More and more development and trade experts now argue that greatly accelerated IT investment and diffusion are essential to the future growth of less-developed countries. Some argue it has become one of the most important single factors in development (World Bank n.d.). Not only can it substantially improve domestic economic productivity, but it can also make less-developed countries much more competitive in global markets. Schware (1991), Moussa and Schware (1992), Hanna (1991), and Pool (1987) believe that IT has become an essential factor for promoting economic development.

According to Talero, "If the NII [National Information Infrastructure] is conceived as consisting of both telecommunications networks and strategic information systems, it assumes extraordinary importance for developing countries. The NII is a new instrument created through revolutionary advances in information technology that societies can now use for the developmental challenges they face. From this perspective, NII is far more fundamental to a developing economy than, say, a broadband facility to the home is for a high income economy" (Talero 1997, p. 290). Talero, a leading expert on IT and development, then discusses some of the challenges IT can address in poor countries, notably: fighting poverty; reducing the isolation of rural areas; educating more people and supporting lifelong learning; making government more efficient, accountable, and transparent; increasing the effectiveness of economic reforms;

monitoring and protecting the environment; promoting small and medium-sized enterprises; and participating in global trade (pp. 290–93).

Restated in different terms by another author: "Of all the many technologies of our time, progress in…IT has no doubt had—and continues to have—the greatest influence on the global economy, making it possible to collect, process, and transmit information at breathtaking speed and declining cost, thereby increasing productivity and improving quality in all types of industries and services" (Hanna, Guy, Arnold 1994, p. 7). He and most others, however, seldom examine the conflict-creating effects of IT.

This revolution is not restricted to the information sector alone. Indeed, the fact that IT is increasingly embedded in *all sectors* is what is making the revolution, and is critical for restructuring dominant patterns of conflict and cooperation. "All economic activities—including agriculture, mining, banking, commerce, and transportation—are becoming fast, flexible and information-intensive. As it changes the generation and distribution of knowledge and ideas in all fields, existing skills and occupations are being undermined and hierarchical structures are being challenged" (Hanna, Guy, Arnold 1994, p. 8). When hierarchical structures are undermined and statuses are overturned, then those affected respond politically to protect their interests, and conflicts result.

The IT Revolution has had impacts across many levels, from macro to micro. At the micro-level of the firm or farm, it tends to reduce hierarchies by cutting intermediary positions and creating some unemployment; it can also facilitate communication among functional and spatial divisions, and between headquarters and field offices. It also affects *inter-firm* relations between the firm and its upstream suppliers and downstream customers. Electronic commerce techniques (electronic data interchange, or EDI) can substantially reduce transaction costs (as with port clearances), further cutting employment in some firms but creating jobs in other firms and sectors.

Information Technology's economic impact can be substantial. Information Technology has the ability to reduce time and distance barriers, thereby making commerce from distant and remote areas more economical (Robinson 1996). Information Technology also creates spill-over benefits for non-users; as telecommunications and appliances are introduced, for example, they may spur growth in the entire area among users and non-users (Lesser and Osberg 1981; Hudson 1984). The benefits of increased IT can therefore constitute a public good. Information Technology may also promote mobility (Cherry 1977) and increase the number and types of personal interactions (Wellenius 1971), both of which contribute to economic development.

However, there are important caveats to be found in the works on IT and development. If there is one finding treated as a truth, it is that incorporating IT into an organization will fail to produce positive, sustainable results *unless it is strategically and efficiently introduced, and carefully led and nurtured through re-training and organizational changes.* This is true universally but especially in less-developed countries, since under-developed countries typically lack the necessary organizational skills to exploit advantages offered by new IT. Just dropping new computers into old structures does not gain efficiencies (Hanna 1991; Hanna and Boyson 1991; Sazanami and Edralin 1992; Meyers 1991; Adkins 1988; UNCSTD 1996).

A second perspective on IT as a tool for economic development strongly suggests that when new technologies are introduced into society, there is no guarantee their benefits will be equitably allocated. New wealth generated by the introduction of new technologies may simply be captured by the powerful and the wealthy. The introduction of new technologies to create the Green Revolution in India found as one result a growing gap between rich and poor. (See also Noble's (1984) analysis of the post-World War II U.S. defense industry.)

Therefore, in order to reduce the likelihood of expanding inequality, IT projects need to be carefully designed. With this dynamic in mind, a working group for the UN Commission on Science and Technology for Development notes the conundrum that "[f]ailure to give priority to the measures needed to address the emerging Global Information Society will exacerbate the gap between the 'haves' and the 'have nots' for less-developed countries, but doing it badly will also create socially undesirable gaps." The emphasis for policy in less-developed countries therefore "must be on the use of information and organizational change, on skills and learning opportunities, on the links between ICT applications and development priorities" (UNCSTD 1996, p. 8).

An essential element of recent economic reforms has been the liberalization of the economy, including and especially the liberalization of the telecommunications sector. In developing and developed economies alike the ownership, and financial and managerial role of government in this sector is now being substantially reduced. These changes provoke different reactions among different groups.

Some (Hills 1990; Quebral 1992; Samarajiva and Shields 1990) argue that developing countries need to resist investor and donor pressures to privatize their IT industries. Others, like Petrazzini (1995), take the opposite tack and argue that liberalization, including modernization, yields development benefits for less-developed countries, including greater investment and better services.

While Hanna, Boyson, and Gunaratne (1996) find IT central to the broad strategies and industrial tactics of the highly successful "East Asian Miracle" countries and show their readers the advantages of aggressive IT strategies, Bruno Lanvin (1996) stresses the terrible costs and down-side risks if less-developed countries do not hook up to the emerging global information infrastructure.

Failure to make such connections feasible for all could conceivably result in a dangerous situation in which only a critical mass of developing countries would upgrade to the global information economy. Entire regions and subcontinents (including most of Africa) would be excluded from [its] benefits. This would do immeasurable harm to the standards of living, health, and environment of these regions. Abject poverty, coupled with heightened isolation, may also exacerbate underground political movements and corruption; illegal traffic of all kinds flourishes when legal activities cannot provide the means for survival. For the North, further performance divergence among poorer countries would thus translate into additional threats to free trade, health, the global environment, and governance. Gross internal economic disparity poses a dangerous challenge to the credibility and political stability of local government. It is often this type of "next door disparity" that spurs the emergence of fundamentalism or traditionalist movements (Lanvin 1996, p. 209).

These perspectives suggest that conflict within and between countries may be provoked as much, or more, by IT-as-embedded-factor-of-production, as by IT-as-medium.

INFORMATION TECHNOLOGY AND CULTURE

One of the most hotly contested political issues about the impact of IT on society is the IT-culture connection. Is there a connection? Is it a strong or weak connection? Is the connection good or bad? And for whom? These are issues which we will not resolve here, but we will indicate the main lines of the recent debates. Since national cultures are so important to most citizens and their leaders, protecting them is a highly sensitive and politicized issue.

One of the most frequently cited positions around the world, relied on by governments and referred to by intellectuals and activists, concerns the right and capacity of governments to protect indigenous cultures and values against what they view as IT-assisted assimilation into global consumerism society. Much of the commentary views indigenous culture at risk in the presence of globalized IT. The counter-arguments rest on the right of people to make choices freely and the positive or neutral impacts of cultural products like cinema.

The "cultural impact" hinges on several assumptions and a tight chain of logic: IT brings increased *exposure* to cultural content; artifacts produced by non-indigenous foreign cultures will lead to rejection of, and *decline* in, adherence to local cultural values and their *substitution* by either anomic or foreign values. Changes in values and attitudes will, over time, lead to a change in *behavior*, with new behaviors inappropriate to and injurious to the health of indigenous society as a whole.

This line of argument is relied upon heavily, but is often based more on simple assertion than the collection and careful analysis of empirical evidence. If, however, one questions the logic at each step, other important questions emerge: Is more exposure equivalent to changes in values and behaviors? Does culturally derived selectivity by audiences filter out what is alien and repugnant to their sensibilities?

The evidence is mixed. Wong reports survey evidence from Asia indicating that when audiences have opportunities to choose between foreign and domestic programming, they strongly prefer local content. Equally interesting, there are cross-national differences within the region about relative preferences for foreign and domestic content (Wang 1996).

There are also more policy-related debates that consider how less-developed-country governments should respond to the challenges. Some argue the most appropriate policy response is to impose negative restrictions on imported content; others argue for more positive encouragement to local and more diverse cultural production using traditional and cutting-edge IT.

Some media more than others may help diminish this problem of undesirable content. For example, videocassettes may be used to buttress indigenous cultures (Cuthbert and Hoover 1991; Ogan 1988). The ease and low cost of producing, distributing, and viewing videocassettes make them an attractive and viable medium to compete with more expensive media such as television and cinema.

Some of the most interesting treatments of the politics of cultural protection and cultural exports are provided by gifted commentators like Samuel Huntington and Benjamin Barber. Their work is well worth citing here because, more than other writers, they address these issues of technology and society with both wide sweep and nuance. Though these two authors differ substantially in their interpretations of the depth, desirability, and effects of the diffusion of Western or modernist (or U.S.) IT around the world, they are similar in that they both emphasize the big picture of the interaction of globalization, IT, conflict, and cooperation. These are issues of great moment that have exercised the curiosity and passion of many social critics.

In *The Clash of Civilizations and the Remaking of the World Order* (1996), Huntington argues that the dominant cleavages which separated nation-state from nation-state in the modern period are dissolving. These were the old certainties of the Cold War, the division of the world into East and West camps. With the collapse of communism, the cleavages that will increasingly drive international politics will be the civilizations that underlie these other splits. Among civilizations grouped mainly around religions, Huntington identifies Islamic, Hindu, Orthodox, and Buddhist; he also sees turf or geography-based civilizations such as Western, Latin American, African, Sinic (Chinese), and Japanese.

This argument is directly relevant to our concern. In Huntington's world, the nine civilizational groupings are primordial. Today, more than ideology, money, or IT, primordial identities guide the fate of the world. In his view, IT is not the great solvent of civilizations. While important, IT is more an instrument of civilizations, not their determinant or destroyer.

Huntington is extremely skeptical about the capacity of IT, mostly coming from the West, to change the attitudes and behavior of individuals in other civilizations. "Little or no evidence exists," Huntington writes, "to support the assumption that the emergence of pervasive global communications is producing significant convergence in attitudes and beliefs." "Entertainment," as Michael Vlahos has said, "does not equate to cultural conversion" (Huntington 1996, p. 59). Huntington also points out that people interpret what they see on the large or small screen through their own values. The bombing of Baghdad, for example, was interpreted very differently by audiences from Western and Islamic civilizations.

In spite of this, concerns about IT can be manipulated by elites because global communications are one of the most important contemporary manifestations of Western power, and they "encourage populist politicians in non-Western societies to denounce Western cultural imperialism and to rally their publics to preserve the survival and integrity of their indigenous culture." Information Technology, in other words, is "a major source of the resentment and hostility of non-Western peoples against the West" (Huntington 1996, p. 59).

Civilization über alles? To this extent, Huntington is similar to Robert Kaplan who sees civilizations and their discontents as ageless and fundamentally driving conflict in the present as in the past (Kaplan 1995).

A more nuanced approach is taken by Benjamin Barber in his remarkable *Jihad vs. McWorld*. Like Huntington, he sees competing world views around the interpretations

of the relative importance of societies and technologies. Because his analyses are both forcefully stated and quite cohesive, it is worth quoting him at length.

> The first scenario rooted in race holds out the grim prospect of a retribalization of large swaths of humankind by war and bloodshed; a threatened balkanization of nation-states in which culture is pitted against culture, people against people, tribe against tribe, a Jihad in the name of a hundred narrowly conceived faiths against every kind of interdependence, every kind of artificial social cooperation and mutuality: against technology, against pop culture, and against integrated markets; against modernity itself as well as the future in which modernity issues. The second scenario paints that future in shimmering pastels, a busy portrait of onrushing economic, technological, and ecological forces that demand integration and uniformity and that mesmerize peoples everywhere with fast music, fast computers, and fast food—MTV, Macintosh, and McDonald's—pressing nations into one homogeneous global theme park, one McDonald's tied together by communications, information, entertainment, and commerce. Caught between Babel and Disneyland, the planet is falling precipitously apart and coming reluctantly together at the very same moment (Barber 1996, p. 4).

About the outcomes, Barber is not optimistic that this clash will lead to progress and the perfectibility of man. Unlike writers in the Enlightenment, or Hegel or Marx, "it is harder to believe that the clash of Jihad and McWorld will issue some overriding good. The outcome seems more likely to pervert than nurture Human liberty. The two may, in opposing one another, work to the same ends, work in apparent tension yet in covert harmony; but democracy is not their beneficiary" (p. 6). Instead, civil society is made vastly poorer, and representative government and liberty are put at risk.

Perhaps Barber's greatest contribution to the debate—and something missed by too many commentators, scholars, and partisans—is the astounding interpenetration of the universalizing and the particularizing halves of the Information Revolution, of the inseparable centrifugal and centripetal forces. Terrorists kill wearing jeans and coveting McDonald's while they bomb U.S. soldiers. "McWorld's videology remains Jihad's most formidable rival, and in the long run it may attenuate the force of Jihad's recidivist tribalism. Yet the information revolution's instrumentalities are also Jihad's favorite weapons" (p. 17), as we saw in the barbarous radios of Rwanda and Bosnia. "McWorld and Jihad do not really have a choice between such polarized scenarios. Together they are likely to produce some amalgam of the two suspended in chaos" (p. 19). Jihad will prove stronger in the short run, "[b]ut McWorld's homogenization is likely to establish a macropeace that favors the triumphs of commerce and markets and to give to those who control information, communications and entertainment ultimate…control over human destiny. Unless we can offer an alternative to the struggle between Jihad and McWorld, the epoch on whose threshold we stand—postcommunist, postindustrial, postnational, yet sectarian, fearful, and bigoted—is likely also to be terminally postdemocratic"(p. 20).

Scattered throughout the diverse and contradictory literature are some inklings of how this may occur. Ultimately, it seems the outcomes will be driven by fundamental political dynamics of the struggle for influence and power, not techno-politics. At the same time, in a world where there are more diverse voices from around the globe, the better balancing of cultural expressions, like the better balancing of market power and political influence, is likely to assuage the tensions.

That is, the more that distinct local cultures and linguistic communities can see their own cultures represented, the more conflict may be reduced. Not the United States or the West vs. "the rest," but the United States and France and India and Brazil and Burkina Faso. Such an outcome is plausibly offered by the newest technologies, which permit each individual (and each collectivity of individuals) to be a publisher, a broadcaster, a writer, a producer of content — not just a passive consumer of other people's content. And that content is interactive. In a future of more grass-roots, decentralized production of cultural content where the gatekeepers' role is reduced, technology may serve as a contributor to a richer civil society, a more civilized global commons where nations meet.

INFORMATION TECHNOLOGY, WARFARE, AND NATIONAL SECURITY

Another side of U.S. concerns with the intersection of IT and political conflict in less-developed countries is a concern with the intersection of IT, violent Third World politics, and U.S. national security. Does this potentially volatile intersection pose a threat to citizens in the United States? While the concept of IT and national security is not yet applied consistently to developing countries, we can anticipate that IT-security issues will also arise within the more advanced developing countries.

There is a fast-growing literature on IT and modern warfare (Arquilla and Ronfeldt 1995). Variously referred to as "cyber-war" or "information warfare," this literature addresses several concerns. Empirically, it analyzes recent examples of the use of modern IT to enhance conventional war-fighting capacities, as occurred during Desert Storm. This literature also examines examples of less-conventional, IT-related acts of violence or terrorism perpetrated on a wide variety of civilian, corporate, and state targets. This includes the possibility of hostile attacks on information assets in the United States such as commercial or public backbones and "secure" databases, and imagines appropriate responses to such attacks. In the tradition of strategy development, military modeling, and wargames, there is a thriving cottage industry creating scenarios of how IT may affect national security in the future.

This literature tends to be rather self-contained and is found in specialized publications like *Strategy* and special reports by think tanks like RAND (Arquilla and Ronfeldt 1995). The edited volume by Stuart Schwartzstein, *The Information Revolution and National Security*, captures the core of this approach (Schwartzstein 1996). Developing countries are treated mainly as potential threats or targets in this literature, as with the discussions of the Middle East and of China in Schwartzstein. Much of the worry is about cyber-terrorism from individual groups or governments in developing countries.

An especially nuanced and broader appreciation of the impact of IT on the conduct of foreign policy is Owens and Nye's treatment of the broader range of issues involved in national security when it intersects with modern IT (Owens and Nye 1996). They move beyond cyber-war to address what they see as America's greatest power, its power over content, its "soft power," and the leverage and influence this provides to get other groups to want what Americans want (Owens and Nye 1996).

There has been very little discussion of the ways that IT might influence the national security capacities and vulnerabilities of developing countries. For example, some spokesmen for less-developed countries have expressed concern that continued liberalization of international telecommunications markets will undercut the reliability and security of their own national telecommunications systems, as they fall under the foreign control of private transnational firms moving in under the newly liberalized GATT rules (Petrazzini 1995). Others are concerned that with 90 percent of the world's patents filed and controlled by only ten countries, they will be at the mercy of the developed "North" in IT development and commercialization. We can anticipate some writings on the conflict and security issues as seen from countries in the "South" in the future.

INFORMATION TECHNOLOGY AND SOVEREIGNTY

Many of these themes of security, development, conflict, and culture come together in the question of state sovereignty in the Information Age. The literatures we review do suggest convincingly that the Information Revolution is eroding the sovereignty of the state in all societies, especially developing ones. The erosion occurs through distinctive "top-down" and "bottom-up" processes, both of which are enabled and encouraged by the Information Revolution. State "sovereignty" in this context means the credibility, authority, and effectiveness of government as expressed both by its own citizens and by powerful external actors in positions to guarantee the independence and authority of the state in the international community.

"Globalization" and its assaults on sovereignty can be felt through both "bottom-up" and "top-down" forces that are driven and enabled through new information and communications technologies. Information-Technology-facilitated "top-down" attacks on state sovereignty result from the many cross-border flows that intrude onto the traditional areas of rights and responsibilities of central governments. A clear example is the lightning-like speed with which pesos and dollars moved into and out of Mexico during the financial crisis of 1995. While the country's central bank and other state agencies welcomed the capital into their country, they, like their counterparts in Thailand and Malaysia, were powerless to stop the sudden waves of capital flight made possible only through the advent of globally integrated information and communications networks. The countries claimed they lost control, authority, and effectiveness (i.e., sovereignty) during this period. Walter Wriston's influential 1992 *Twilight of Sovereignty* elucidates these globalizing, sovereignty-reducing dynamics.

"Bottom-up" globalization, by contrast, is driven by other forces, but here too IT plays an important role. Grassroots non-governmental actors, such as non-governmental organizations, small business, and individuals use IT more and more. Because IT has become cheaper, non-governmental groups and organizations can better afford it. This allows them to reduce the cost of their "message," to communicate easily with one another, to provide services, and thereby increase their power relative to the state. Interviews with non-governmental organizations by this author in West Africa confirm this trend.

This line of argument reasons that the modernization and globalization of IT lowers communication and coordination costs for non-governmental organizations and

social movements. Lowering the cost and increasing the volume of IT then strengthens non-governmental organizations and social movements at the expense of the central state by increasing the former's ability to distribute their messages, mobilize support, and influence public discourse (Brysk 1993; Annis 1990, 1991, 1992; Swett 1995; Rosenau 1990; Livernash 1993; Afonso 1990; Ganley 1992; Garrison 1989; Frederick 1992, 1993, 1993a; Taylor et al. 1993; Li 1990).

These influences can have varying impacts, since different non-governmental organizations and social movements seek different goals. Some non-governmental organizations seek disarmament, others a higher defense budget; some seek gun control, others wider gun ownership; some urge their members to oppose birth control, while others, using the same Internet or Web sites, support it vehemently. Analysts look at Internet use among groups as disparate as Planned Parenthood, narcotic cartels (Blumel 1996), and political rebels (Ronfeldt and Thorup 1995; Swett 1995).

Another argument is that rapid communication greatly accelerates the pace of politics, especially expectations and demands for immediate responses from government officials, thereby reducing the time for reflection and more careful calculation. If responses are not immediately forthcoming, key publics are disappointed and perhaps disaffected; if the responses come too quickly but without adequate thought and reflection, then there are substantial political risks of poor political and policy performance. Destabilizing the state further reduces the state's ability to react effectively (Sterling 1994; Rosenau 1990).

A now-classic case of "bottom-up" influence intersecting with "top-down" influence is the Chiapas episode. During this rebellion in rural Mexico, the military and civilian authorities found their room for maneuver extremely reduced by the organizational effectiveness of the local populations and their remarkable ability to use faxes, Internet, and other means of modern communication to contact and draw support from international sympathizers. Information Technology in this case helped mobilize and unite transnational communities of common interest. This threatened the sovereignty of the Mexican state from the outside. As a result, it was forced to be more open and accommodating because the local dissidents were in frequent communication with their sympathizers abroad. These foreign colleagues, in turn, lobbied their own governments and the press to keep Chiapas in the international spotlight.

Beyond attacks on state sovereignty from above and below, there are other pressures on the state from its own budgetary crises, and from multilaterals, to literally cut itself back through the extensive privatization and commercialization that is shrinking and redefining the role of the state in many areas—particularly in telecommunications activities. The private sector is expanding its authority in this area at the expense of the state (Kahin and Wilson 1997).

Thus, we see formal state sovereignty eroded by IT at the turn of the century as private firms, non-governmental organizations, and other actors use these new techniques to pressure states to adopt particular policies or seek to replace the state entirely. Sometimes this is done from one direction only; in other cases, these non-state actors form cross-border coalitions to "gang up" on the state from all sides in an attempt to push for change.

CONCLUSION

We began this review by identifying several important cleavages that seem to run through the literature on the globalization of IT and that are also found at the intersection of other technology-society issues (Mesthene). Having reviewed the arguments pro and con on these themes, how can we answer three basic questions? We recognize, with Barber and others, that answers to these questions are rarely dichotomous or clear cut, but we believe the following broad conclusions are warranted, in order to clarify this evolving subject.

Question Number One: Does IT or Society Determine Outcomes Where the Two Intersect? Our findings: Society dominates. From the variety of uses to which the same technology has been put in different circumstances, it is apparent that "IT" is not a disembodied force, autonomous and above society. Information Technology does not shape society; groups in society, whether Hutus in Rwanda or rebels in Chiapas or entrepreneurs in China, seize IT as a tool to pursue their interests. In instrumental terms, IT is mainly a tool or a resource wielded by, or on behalf of, one group or another, according to the group's definition of its own or the common good. The distribution or diffusion of the technology takes place within the context of a particular distribution of power and wealth within the society, especially when viewed in the short term.

More important than IT are underlying societal forces such as values, institutions, the distribution of power, and the ways that social actors interpret their potential losses and gains. These facts will ultimately filter and shape the IT-society interaction. The determinative role of social structure, values, and politics are revealed when the "same" IT is introduced into different societal contexts where outcomes are quite different. The Information Revolution, for example, is impacting Africa very differently from Asia, not because the technologies are different but because the societies are so different.

Question Number Two: Are the Impacts of Globalized IT on Society Big or Little? Our answer: Mostly little, in less-developed countries. The evidence we have so far is that the impacts of IT on societal fundamentals appear to be modest. Despite the almost hysterical hype, evidence indicates that the new ITs *thus far* have had limited impacts in developing countries. Much of the language in the literatures uses the future and the conditional tenses: will, may, should. In many ways, it is a language of anticipation and prediction more than demonstrated impact. This holds for IT in both its incarnations, as-media and as-factor-of-production. Pockets of the population have been affected, as in India's "Silicon Valley" of Bangalore, where foreign investment, job creation, and international transactions have skyrocketed. However, that is a very small pocket in a very large country.

It is salutary to remember that most Third World citizens have *never* used a telephone. Most probably lack a radio. There are more telephones in Tokyo or Manhattan than in all of sub-Saharan Africa, and Internet use in Africa can cost a

month's salary or more. Not surprisingly, the diffusion of ITs like the Internet and the related World Wide Web is quite low.

In addition, the lives of most citizens are impacted only modestly by embedded IT; their jobs, transportation, daily lives, are as yet little affected. But over the coming decades, they certainly will be more directly affected as microprocessors shift the whole meaning of comparative advantage and international competitiveness. It is almost certainly the case that observers today overestimate the short-term impacts of new technologies and underestimate their long-term impacts.

Question Number Three: Are IT Impacts Positive or Negative? The short answer is, "Yes." This complex interaction is decidedly not an arena of "either-or." Introducing IT from abroad will improve the social position of some and worsen the position of others. Some will gain jobs, freedom and education; others will lose all three. Still others will experience no change in their status one way or the other. Responses to these changes will not be uniform across countries, nor even within countries. They will be shaped by local cultural values through which winners and losers filter their realities; culture provides the lens through which people evaluate what is good and bad.

At the broadest level, and with a long term historical perspective, we see in global IT markets the classic example of Schumpeter's description of the double-edged nature of "creative destruction." Capitalism's dynamic creates whirlwinds of creation, with new industries and new services surging forward, mobilizing whole regions and nations, and privileging new groups. Simultaneously, other regions, nations, and groups experience the collapse of company after company, massive financial losses, surging unemployment, and the destruction of peoples' ways of life.

This fundamental creation/destruction dynamic is accompanying the changes underway today in global IT markets. One can say with Reich and others that in the IT Revolution, workers with more education, capable of manipulating symbols and using abstract logic, will do better; but manual laborers will do worse. National and corporate systems that learn to improve and maintain their schools and universities, educate most of their population, and teach them to learn continuously, will do better. In the Information Revolution, as in all revolutions, there are winners and losers. Contrary to the optimists, all do not automatically win.

ORIGINAL HYPOTHESES

Beyond these three main cleavages, we also tried to explore several hypotheses specific to the media elements of the global IT Revolution. They centered on the capacities of the Information Revolution to mobilize people toward envy, attraction, reaction, and rejection. One hypothesis holds that poor populations' exposure to global, and especially Western, media leads them to demand of their own governments more than the latter are able to deliver, i.e., the West's material wealth and political liberty. Frustration grows. Political conflict results, as the poor and their governments clash.

The second hypothesis also posits developing-country populations exposed to Western media content, and then reacting negatively and angrily to its materialism, its individualism, and other traits. The rejection may lead to various forms of fundamentalism

and chauvinism that may have domestic and international political consequences. This may include conflicts with governments, especially pro-Western ones.

Once again, the empirical evidence in the literature does not show that either of these two patterns is more likely to appear than others. It seems equally likely that media exposure and advertisements make people want the things they see, and they then seek various ways to obtain them. The vast majority are willing to make personal sacrifices, to move to cities, to work harder or to shift jobs, in order to get what the modern materialist world has to offer. It is likely that the fast-rising sums spent on advertising do contribute directly to this outcome (Barber, 1996).

The steps between media-generated perception, envy, rejection, and violence are not carefully delineated in most of the work reviewed. It may be that, *under certain specified conditions*, the demonstration effect may inflame social tensions and exacerbate underlying social inequalities, but the exact links from viewing to dissatisfaction to violence are almost never examined. To argue that the poor in less-developed countries watch satellite television and then rebel against their governments, is far too simple and unmediated an explanation of a very complex social process.

The particularly nasty, intractable and difficult conflicts today result not from threats delivered over long distances on CD-ROMS, computer disks, or by satellite DBS. They are much more intimate: face-to-face conflicts between neighbors in Israel and Palestine, between Indians and nearby Pakistanis, between Sudanese in the same country, North and South. Intimacy breeds as much violence as ITs.

Thus, the historical discontinuities between the period before the onslaught of the Information Revolution and the digital present seem not so great after all in most less-developed countries. Modern IT seems to be spreading like a slow uneven rising of pools, streams, and eddies; not tidal waves or whirlpools or a flooding tsunami.

UNEXPECTED FINDINGS

In this study we also came across interesting answers to questions we did not originally pose. One was the recognition that IT-as-media and IT-as-embedded-factor-of-production are substantially different, and that most of the literature concentrates on the former. The biggest unexpected conclusion is the confounding of IT-as-media, and IT-as-embedded-factor-of-production. Some scholars pay attention to one, but rarely the two together.

Of the two, the biggest impact on less-developed country stability and instability in the future will be IT-as-embedded-factor-of-production. The biggest impact may be—or arguably already is—the information-processing power of the computer chip. This is increasingly affecting cross-national investment decisions, job creation, innovation patterns, and so forth.

Another somewhat unexpected finding is the high degree of agreement that the sovereignty of the state is being eroded by the globalization of IT. This seems to be occurring in two ways. First, the globalization of words and images, broadcast and narrowcast by satellites and the Internet, is reducing the capacity of the state to control information within its borders, once a sovereign right. Information

Technology is used to speed the transfer of other bits and bytes around the world, e.g., the one trillion dollars that flows around the world daily, which also erodes state capacity from the supra-national level.

At the same time, actors at the sub-national level are gaining access to new IT in all its forms, as media and as processing capacity, that permits local non-governmental organizations to bypass the state in international dealings. These also permit other local actors, like private firms, to bypass the state and to perform internally tasks once only the state could provide (such as telephone services). The examples of these trends are sometimes dramatic, but rarely are they deep and widespread. Changes are taking place, but diffusing slowly.

Information Technology amplifies other global trends that also challenge traditional state prerogatives. Because local cultural, institutional, and economic conditions differ so greatly, predicting any constant set of results for conflict and cooperation is impossible. Some states will adjust quickly, get ahead of the global IT curve, and respond creatively to new challenges as opportunities to better listen to, serve, and support their citizens. Their sovereignty may thus be enhanced. Other states, dreading changes prompted in part by IT, will provoke violence through their recalcitrance. These IT trends provide a set of important research and policy priorities that other researchers and analysts can usefully pursue in the United States and internationally. Indeed, an exciting research opportunity now available, as never before, is for scholars of different institutions, countries, and cultures to collaborate and cooperate to pose, and to seek to answer, these provocative questions of IT and society's mutual impacts.

RESEARCH AND POLICY IMPLICATIONS

Several research and policy implications flow from these conclusions. First, there is a manifest need for serious and rigorous cross-national research that will consistently test the same hypotheses relating IT to various societal outcomes, in two or more countries. As part of such an effort, one needs to develop objective and sophisticated indicators of both diffusion and social impacts. The International Telecommunications Union (ITU) has developed indicators for telephone penetration, but there is no counterpart for the newer technologies. Second, there is a lack of serious national case studies of the expansion of IT in developing countries, especially using a single analytic framework. One exception is Kahin and Wilson (1997). Preparing single country and comparative studies is essential both for scholars and practitioners. Once prepared, distributed and read, they help create analytic accounts and "stories" of IT diffusion and its impacts that communities of scholars and others can debate.

Because of the wide variety of technologies, applications, contexts, conditions of use, and impacts, there is no one substantive policy conclusion to be drawn from this review. We cannot, for example, urge governments to develop radios and avoid the Internet because one produces conflict and the other does not. The evidence on IT's societal impact is not decisive. Indeed, governments in developed and developing countries alike should be very wary of adopting laws, regulations, or other strictures on IT based on partial, superficial, or anecdotal evidence. "Conventional wisdom" is often incorrect.

We can say, however, that the societal impacts of IT, whether on employment, investment, mass education, health, or national security, do need to be analyzed and carefully followed by governments in developing countries. In none of the reports, studies, and articles did we find adequate treatment of IT itself, and its impact on conflict and cooperation, from the perspective of the developing countries themselves. Much work remains to be done.

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