The Dynamics of Policy in a Networked World

Recommended Citation

Philip Agre, "The Dynamics of Policy in a Networked World", Information Technology and Tools Global Disclosure Project, December 10, 1999, https://nautilus.org/information-technology-a-d-tools/the-dynamics-of-policy-in-a-networked-world-2/

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DRAFT - Please do not quote or cite - DRAFT

Internet and International Systems:
Information Technology and American Foreign Policy Decision-making Workshop
Nautilus Institute, San Francisco, December 10, 1999

1 Introduction

The distinction between domestic and foreign policy has been part of the common sense of politics for hundreds of years. In the United States, for example, the Constitution explicitly divides responsibility for the two realms, with Congress having the initiative in the domestic area and the executive having the initiative in foreign affairs. The Internet, however, threatens to undermine this distinction. In a world where everything is connected to everything else by ubiquitous networked computing, societies and polities interact on numerous levels. Even when the formal mechanisms of government proceed along their accustomed lines, state policy-making is increasingly embedded in global policy processes. It is not just the Internet, of course, that brings such changes about. At best the Internet can participate in, and amplify, structural forces for global integration that have many other expressions as well. The Internet's revolutionary reputation should not be allowed to obscure a more complex reality. Nonetheless, it is worth exploring the question: in an Internet world, all policy foreign policy? And if so, what consequences follow for the policy-making process?

The topic is broad, and it will be useful to focus on particular areas where existing theories offer useful suggestions.

2 Preliminary cautions

Because serious research is an inherently slow and cautious activity, public discourse about the social consequences of the Internet has been shaped primarily by the broad-brush pictures of enthusiasts. Whereas educated in opinion in ancient Greece was deeply skeptical of the societal impact of writing, in modern times the skeptics have been a marginal minority. Every new technology creates an imaginative vacuum, and time and again the same sorts of material tends to flow into it: pictures of peace and prosperity, enlightenment and freedom, uplift and perfection. These pictures all surely have their grains of truth, but they are fundamentally religious in nature; they draw on a vast

millenarian tradition whose ties to technology are long-standing and profound. In order to reason seriously about the place of information technology in the making of foreign policy, it will be necessary to exercise special caution, anticipating and questioning a great many of the taken-for-granted assumptions of the enthusiasts' discourse.

First of all, serious research on this subject must watch out for the language of technological determinism. Technological determinism has two aspects: (1) the idea that technology develops autonomously, that is, along lines that are inherent in the technology itself and not influenced by anything else in society; and (2) the idea that technology has "effects" or "impacts" on society that are determined entirely by the technology itself, and that do not depend on the societal context in which they occur. These positions are usually not defended explicitly; rather, they enter a discourse through figures of speech that foreclose investigation of the interactions between technology and the rest of the social world. Detailed empirical studies have repeatedly shown that the directions of technology are not inevitable, and that technology is shaped in important ways by social forces. Moreover, it is usually not possible to explain the societal changes that will accompany the use of a technology simply from the workings of the technology itself. A decentralized computer network, for example, does not necessarily bring about a decentralized society. Likewise, we can speak of the democratic potentials of the Internet, but to say that the Internet itself causes the spread of democracy is a much stronger statement.

As an antidote to technological determinism, it is helpful to begin with an amplification model. On this model, information technology creates little that is new. After all, the main tradition of computer system design begins by mapping out existing information flows and inscribing them onto the logic of hardware or software. The Internet, likewise, will only be used in ways that people can imagine, and that fit in somehow with their existing system of concepts, motives, habits, and relationships. The Internet may thus help to amplify some of the existing forces in society, and this can be important all by itself. Nonetheless, it will often be frustrating to explain just what social changes the Internet brings. When pointing at a particular example of amplification, whether positive or negative in its results, a skeptic can usually say, "that's nothing new". And indeed when considered in qualitative terms it is probably not. Any qualitative novelty is likely to be found downstream, when the balance of forces that gave rise to a given institution starts to break down under the selective amplification effects of the new technology; at this point new institutional forms may well arise. Little of this has actually happened so far, but at least the amplification model suggests where to look for it.

As this discussion suggests, one cannot reason about the role of information technology in the evolution of a given social process without possessing a detailed anatomy of the process and an equally detailed physiology of the forces that have made it what it is. The Internet interacts with a multitude of structures and forces in any advanced society, and so one cannot begin to evaluate the Internet's overall role in a given domain without considering the entire domain -- at least in its informational aspect. As a result, a survey of the role of information technology in policy-making will sound like a survey of policy-making in general that happens to mention information technology every few lines. One will find no real boundary separating the technology from everything else. In the case of foreign policy, it will be necessary to consider the role of technology on several levels: in the relatively narrow policy community, in the workings and interactions of societal interests more broadly, and in the whole complex global playing field of economy, politics, and culture to which the issues themselves pertain. Nobody can master the entirety of this material, and so any initial survey will inevitably oversimplify. In the long run, the key is to analyze the role of information technology on each level, and then to explore how the levels themselves interact.

This kind of analysis has some obvious limits. The Internet contributes to society in many ways, and these can be hard to add up to produce a single bottom-line generalization about the technology's impact. Indeed one should regard any such generalizations with tremendous skepticism. Information technology, after all, is exceedingly malleable, and accordingly it is being appropriated as part of thousands of social projects, many of which conflict with one another. Left and right, labor and management, business and government, large and small: every part of society is using the technology in its own way, for its own ends. To the extent that widespread concerns for equity of access are translated into practice, the picture will only become more confusing, as in some sense it should. Eventually it will seem strange to speak of "using the Internet" as a distinct category of activity, any more than "using the telephone", and discussion will return to the substantive processes and goals that various social groups pursue.

Other epistemological problems are even more straightforward. It is hard to determine the actual role that information technology is playing in any given case. One can observe the activity of using the technology, and one can observe any changes in structure and process that may have occurred, but any simple ascription of cause and effect will probably be misleading at best. A serious investigation will usually find that many other factors besides technology -- political, legal, cultural, interpersonal, and so on -- play a role as well. Because information technology is so often used to amplify existing forces, no explanation will be complete without an account of those forces, including the detailed

forms of activity through which they are put into effect. This kind of investigation will obviously be slow, and the reality may change before the research methods can take logical hold of it.

Finally, even though one usually undertakes such investigations for purposes of making predictions and formulating prescriptions for future action, any prediction is at best an principled extrapolation from analyses whose conceptual foundations may well have been rendered obsolete by the profound structural nature of change. The very idea of prediction, furthermore, tends to presuppose that the future is inevitable. Perhaps it is not, and the possibility and necessity of human choice should not be ruled out from the start.

3 Properties of the technology

Analysis of the Internet's potential role in any domain requires a basic understanding of the technology and its properties. The Internet, first of all, is not any particular piece of machinery, much less a particular company or government. The core of the Internet is the Internet Protocol (IP), a language that computers can use to exchange information over a network. IP is a simple protocol, and indeed its success results largely from an explicit philosophy of simplifying the communications protocol as much as possible, moving as much complexity as possible out of the network and into the computers that use it. Because IP was developed at public expense and placed in the public domain, anybody is welcome to build hardware or software that complies with it. The phrase "the Internet", therefore, refers simply to the whole world of computers that use IP to exchange data with one another.

The basic functionality of the Internet, then, is moving information, in "packets" of digital bits, from one computer to another. The information might be moved directly in one hop across a single wire, or it might be moved in numerous hops, passing through numerous "routers" on its way to its destination. The IP protocol is indifferent to the physical technology that is used to move the data, and it works equally well on old-fashioned copper wires, new fiber optic cables, wireless data connections that radiate the data using radio waves, microwave links that aim the data in a straight line across the landscape, satellite uplinks and downlinks, and many other options. Indeed, one could implement IP using bicycle messengers, or printed information sent across town using pneumatic tubes, so long as the formal requirements of the protocol were upheld. Furthermore, the Internet is easily connected with other networks, including low-technology store-and-forward mechanisms such as Fidonet that are widespread in developing countries. The IP protocol is also indifferent to the kind of data that is sent through it. For example, IP does not recognize any difference between Web pages and email, or between audio signals and stock quotes, between English and French, or between encrypted and plaintext messages.

As a result of these distinctions, IP is often referred to as "middleware": it sits in the middle between the mechanism for moving the data and the programs that consume and produce it. More generally, the Internet is "layered", with IP serving as a layer of network services that rests on top of the "subnetworks" (which might use a wide range of technologies) and underneath the "applications" (which might involve several layers themselves). Layering is a strategy for controlling complexity: instead of trying to build all of the tremendously complicated functionality of a modern computer system in one large package, layering divides the complexity into smaller packages whose relationships are thought out rationally in advance. Layering also has the advantage that new types of subnetworks (involving optical data transmission, for example) can be added simply by implementing IP for the new hardware; the existing applications never need to know about the addition. Likewise, new applications programs can be added simply by writing a single interface between the application and the IP layer, without paying any attention to the diversity of hardware underneath that layer.

This brief description suppresses a great deal of detail, including some other important service layers, but it does point toward the intellectual substance of research on computer networking: assessing the needs of various current and predicted applications, and then parceling the necessary complexity into layers. If the Internet design strategy is working correctly then most of the new functionality that will be required for a new generation of audio and video services, for example, can be implemented by building new layers on top of IP, rather than adding extra complexity to it. Changing the IP protocol poses a considerable problem of coordination, given the multitude of diverse contexts in which it is being used.

These descriptions are principally technical, but for present purposes the Internet's most important attributes concern its embedding in institutional contexts. Among the various technologies, information technology is particularly stringent in its demands for (what economists call) complementary assets. Using a computer, for example, usually requires advanced skills. It also requires electricity and an overnight delivery service for spare parts, both of which in turn require elaborate infrastructures that are not always available. Thus the Internet is at home in complex technological environments such as first-world universities and corporations, but it poses significant demands in other

environments. An organization wishes to use the Internet must find someone to maintain the complex machinery that it requires -- not the internal complexity of the network, which is not great, but the complexity of the machines that the network connects. Thus Kling [] speaks of the "web" of social relationships that are required to keep a networked computer working in practice. An IBM PC-compatible personal computer running Microsoft Windows, for example, is certain to break down on a regular basis, and trained staff will be generally required to keep the machinery running. If several machines must be networked together, then someone must keep track of the innumerable configuration variables and failure modes of even the simplest local area networks (LANs). Even when money is not a problem, much managerial overhead is required to hire and manage the right technical people, particularly when the managers are not themselves technically skilled. In practice, the simplest uses can be managed by offloading much of the complexity to an Internet Service Provider (ISP) who can offer services such as Web site hosting that alleviate the complexity of maintaining an Internet site. Nonetheless, much technical progress will be required before any nontrivial Internet device will approach the "plug it in and it works" simplicity of the telephone.

This contextual complexity of the Internet, relative to the telephone and many other technologies, holds significant consequences for international organizations and policy. Widespread concern with equity of access to the Internet and other advanced digital networks is certainly valid, but its emphasis is often misplaced. The fundamental problem is not the cost of computers, but rather the complex system of relationships that is needed to keep the computers running and use them effectively. Many of these relationships involve telephone companies, whose systems and organizations are adapted for different purposes. Even if those companies are privatized, they are still burdened with an enormous installed base of old technology, as well as old forms of thinking and working among their employees. The often fragile nature of the existing infrastructure means that these organizations have legitimate reasons to regulate the Internet Service Providers who might operate over their lines, but this legitimate type of regulation too easily expands into an illegitimate restraint of trade against the new Internet industry. This is still a serious problem in the United States, and it is even worse in most other countries, including many if not most developing countries.

In exchange for its administrative complexity, however, the Internet offers a vast design space of new information services. Whereas the telephone system provides a limited range of services within the constraints of a traditional service model, the Internet can support any service that can be implemented by moving digital information around. Thus, for example, one can build a telephone system on top of the Internet. Of course, a copy of the existing telephone system would be a poor use of the Internet, given its intrinsic complexity. But one could also use the Internet to build a generalized conference call system that can be used concurrently with a system for cooperative authoring of documents that are simultaneously visible to all of the participants in a given conference call, and to no one else. Meanwhile each of the participants in a shared writing session could be simultaneously using other Internet applications, perhaps while monitoring the writing session in the background for any issues that might require their specific attention. The bandwidth requirements of this kind of application still place it firmly in the future. But experiments with such systems are under way at numerous laboratories, and the necessary networking and computing capacities are already available at many advanced university and industry sites.

Organizations whose work involves complex collaborations among far-flung parties should certainly monitor these developments. In fact, many of the results of this research are counterintuitive. Video-based teleconferencing, for example, is an idea much older than the Picturephone, and yet it has found little use in practice, even where the technical capability is routinely available. For reasons that are not entirely clear, current digital video connections do not appear to transmit all of the physical or auditory cues that people rely upon to manage the fine details of their interactions in real conversations. This may change once the available bandwidths increase, or when the identity of the missing interactional cues is discovered, or simply when users become accustomed to the strange dynamics of video-mediated interactions.

Although many useful Internet functionalities lie in the future, several generalizations are nonetheless possible about the conditions under which the technology is useful. As a very general rule of thumb, the Internet is more useful for "mechanical" interactions than for "ritual" interactions. That is, electronic mail is ideally suited for sending formal letters and setting up meetings, but it is poorly suited for creating new relationships, negotiating complex agreements, communicating across barriers of culture or worldview, or resolving deep conflicts. Once a relationship is established, however, the Internet is a very useful too for keeping the relationship in working order by means of a steady stream of simple favors and routine businesslike interactions. In general, it is useful to consider the Internet as simply one element in a larger ecosystem of communications media. The Internet does not replace face-to-face communication, for example, but it does enable each medium to seek its appropriate niche within the overall system. To take another example, the Internet is not a good tool for building a political movement. But once a cadre of activists has been organized and trained, the Internet can efficiently replace the fax machine as a means of keeping the activists informed, as well as for calling them to action on short notice as circumstances warrant. Each medium can be used

either poorly or well, in other words, and the great variety of frivolous and destructive uses of the Internet should not be interpreted as inherent properties of the Internet as such.

The Internet enters into a great many social dynamics, and the workings of these dynamics can depend in some detail on the technology. For example, the Internet is a useful means for propagating information, since individual users who receive a valuable message can easily forward it to their acquaintances, or to the members of a discussion group. Those individuals can then forward it to others in turn. Although a message can theoretically propagate to a vast number of people at a great social remove from its origins, in practice the mechanisms of forwarding tend to deface the message with indentation markers, extra headers, and other such detritus. As a result, the message itself can become unintelligible once it has been forwarded more than once or twice.

This example illustrates the crucial role of applications architecture in the practical use of the Internet. Nothing about the Internet Protocol even dictates that things called "messages" even exist, much less that they be defaced by the mechanisms that forward them. Likewise, the concepts that are embedded in Internet applications can have far-reaching consequences for the social relationships that the Internet supports. For example, a systemic problem with current Internet applications is their lack of respect for their users' personal boundaries. The Web, for example, supports a wide range of relationships between Internet users and the organizations that maintain Web sites. Sensitive private information is routinely communicated between the user's computer and the server on which the Web site runs. But these information flows are generally not made transparent to the user, thus leading to a certain justified paranoia about "cookies" and other such mechanisms. Electronic mail, to take another example, does not provide users or their machines with enough information to filter incoming messages. As a result, unscrupulous advertisers can send out vast quantities of junk mail at very low cost, knowing that most of the recipients will at least have to look at it.

Other broad generalizations are possible about organizational adoption of Internet services. It is clear, for example, that real productivity increases from the adoption of any information technology, networked or otherwise, depends on a thoroughgoing change in organizational structure and strategy. The natural route of simply amplifying existing practices does not suffice. Of course, the necessary reorganization will presumably amplify deeper and more structural forces affecting the organization and its relationship to its environment, and any change process will have to include broad-based analysis of those forces and the factors that affect them. Many prescriptions for this kind of IT-enabled organizational change can be found in the management literature, but there is no substitute for experimentation. The technology may be relatively expensive at present, but the fundamental prices of the technology are dropping quickly. Institutional learning curves, meanwhile, are slow, and so few organizational contexts exist in which the cost of the technology narrowly speaking is the major limit to thoughtful adoption of the technology.

A final generalization about the adoption of network services is known to economists as "network effects". Network effects arise when the utility of a service depends on the number of other people who use it. Electronic mail, for example, is useless if only a single person has it. It becomes marginally useful when a hundred people have it, quite useful when a million people have it, and extremely useful when a billion people have it. Because the purpose of networks is to connect distant parties, most network services exhibit network effects. As a result, new services often require months or years to become established, if not decades, because too few users have the incentives to become early adopters. Once the service finally obtains a critical mass of users, however, its use can explode overnight, growing rapidly until it begins to saturate its potential market, which consists of those users who possess all of the complementary assets that the service requires. The consequences of this pattern for organizations are complicated. An organization may choose to be either a leader or a follower in the adoption of new network services, but any choice should be based on reliable intelligence about the practices and intentions of other users.

4 Democratic culture

Political life is largely about communication, and so one might expect the Internet to have a tremendous impact on politics. Yet the Internet's role in the formal political system has so far been negligible. Of course, electronic mail is used alongside fax machines and telephones by many of the important institutional players in the political systems of many advanced countries. And as a younger generation succeeds to positions of power, e-mail's place in the political system will presumably deepen. A significant proportion of the world's political organizations also have Web sites. But for purposes of structural analysis, electoral politics is still dominated by television. Compared to television, the Web not yet a significant means of communicating political messages to voters, much less interacting with them. One problem is simply penetration: not enough voters use the Internet intensively enough at this point to make a difference, and television networks still have vastly better methods than Web sites for gathering large audiences. Electronic mail is likewise an insignificant means of communication between elected representatives and their

constituents. Part of the problem with electronic mail, ironically, is its very ease of use: elected officials' offices cannot distinguish thoughtful messages from mass-produced noise, and so they effectively screen it all out.

The Internet's major role in politics thus lies elsewhere. The next section will describe some of the drivers of a rapid wiring of the policy process. This section's concern is more fundamental: the role of the Internet in the development of political culture. The question can be approached from a number of converging perspectives. Much has been written, for example, about the role of civil society: the great sprawl of nonstate associations (cultural, religious, business, scientific, recreational, and so on) that counterbalance the state in any healthy society. The Internet is, if nothing else, the great friend of civil society; it provides a very general platform for building and running associations of every sort. The effect is hard to measure, of course, not least because of fundamental difficulties in measuring levels of activity in civil society generally. And even an accurate measure at the present moment would be unfair to everyone concerned, given that nongovernmental organizations (NGOs) worldwide have been slow to adopt the technology. The reasons for this slow adoption are numerous. NGO staff members tend to focus on the substantive issues that define their organizational mission, sometimes at the expense of the more professional concerns of structure and process. Whereas the private sector has arguably overinvested in information technology without a clear payback model, constrained budgets in the NGO sector have until recently made the costs of adoption excessive. Falling costs of technology should change this calculation for most organizations over the next few years, at which point the impact on civil society can perhaps be assessed rather than simply predicted.

In the near term, at least, the major political role of the Internet lies below the level of organizations. Although the Internet is used for many purposes, perhaps its dominant use is the spontaneous comparing of notes between people who share some interest in common. The great majority of Internet discussion groups, for example, are defined in terms of such interests: aviation hobbyists, Chinese expatriates, cancer patients, law professors, members of particular work groups and committees, and so on. Reliable figures are hard to obtain, but many thousands of these groups are open to the public, and many thousands more are private. The groups are, of course, uneven in their intensity and quality of interaction, and some of the more raucous public groups have threatened to give the whole phenomenon a bad name. But taken all together, the impact of these many online discussion groups is surely important. They are well understood as a kind of collective cognition: the sort of "thinking together" that becomes possible when people find themselves in slightly different versions of the same situation. Much valuable research has been conducted on the internal dynamics of these groups, which tend to operate best with a low but non-zero level of governance. They are typically led by a "moderator" (defined as a individual who has formal power to allow or disallow particular contributions to the discussion) or a "host" (defined as an individual who welcomes members to the list and settles disputes). Successful forums can stay alive for years, or they can collapse in discord, depending on numerous factors. Together they constitute a massive experiment in spontaneous democracy.

But the significance of online discussion groups goes much further. Because each group is defined in terms of a shared interest, it usually follows that the group members also share certain relationships. Cancer patients, for example, must all contend with medical personnel, insurance companies, and family members. And in each case, the conduct of these relationships is a major topic of discussion. These sorts of institutionally organized relationships are the fine grain of society, and online discussion groups influence that fine structure when they introduce new dynamics into those basic relationships. Parents can compare notes on their children, customers on their suppliers, patients on their doctors, and so on. This desire to compare notes, of course, is already found in a thousand other social forms: professional conferences, support groups, formal associations and their publications, rumor mills, socializing in market squares, and so on. As in most other cases, the Internet is serving to amplify these existing mechanisms for sharing information and experience. In this sense, online discussion groups make visible an important layer of social process that has generally been ignored by social analysis. Although measurements are elusive, we might expect the Internet to have its major impact in situations where those existing mechanisms do not suffice: for example, when the group in question is spread out geographically, when members of the group are thinly distributed and so cannot form local groups, when group members are poor enough not to travel often but wealthy enough to afford the cost and time to use the technology, when physical disabilities or social barriers make other forms of association difficult, where economic incentives do not exist for individuals to establish themselves as professional leaders or consultants who synthesize the thinking of the group's members, and so on. Of course, these will often be the same groups whose access to the technology is most difficult. But as the technology does become more widely accessible, we can anticipate that the results of its widespread adoption among disadvantaged social groups will be considerable.

In this way, the Internet holds out the promise of a fundamental sort of democratization of social life. Nothing is inevitable about this promise, of course. The desire to socialize online will always be mediated by many factors. The people involved must have an objective interest in associating, as well as a subjective sense of shared identity. They must be aware of the idea of online association, and they must be accustomed to the cultural and organizational

forms. These subjective and cultural factors are especially significant when the social groups in question cross borders. For example, people who share a given political interest may have no trouble conceiving their commonalities with others in their own country, but a multitude of factors may prevent them from making common cause with their counterparts in other countries. This is, of course, a longstanding problem of political work. The point is that the Internet removes many of the logistical barriers that have frustrated political cooperation and other cross-border community-building projects, so that the remaining barriers are largely cultural in nature.

Each case of cross-border community building will have to be analyzed on its own terms. In the technical area, for example, computer programmers worldwide have experienced very little trouble building cooperative institutions for writing and maintaining open source software such as the free Linux operating system. Cross-border cooperation in this area is relatively straightforward because every conceivable factor is favorable: English provides a global language of technology, technically respected computer gurus such as Linus Torvalds can provide almost undisputed leadership, the community shares a deep consensus about what constitutes good work, these criteria of success are essentially identical in every country, the computer code itself provides a shared object of work and a robust intersubjective ground for interaction, career incentives exist to promote participation in the community, and a powerfully held ideology both leads to solidarity against a shared enemy (e.g., Microsoft) and helps to coordinate activity with a minimum of central control. In this environment, borders are nearly invisible.

Nor is the societal impact of online association entirely positive. The Internet is equally friendly to good and bad, and political extremists have been active on the Internet, especially on the far right. (The moderate left has long been active online, for example through organizations such as the Institute for Global Communications, but the far left has self-destructively tended to view the Internet as simply another means of capitalist production and social control.) The Internet thus requires a society to have faith in the political sensibilities of ordinary people -- that extremist viewpoints, for example, will call forth organized rebuttals within the framework of a peaceable public sphere. This faith has proven elusive in nations such as Germany that have had catastrophic experiences with extremism, and yet it is most unlikely that extremists can be wholly prevented from communicating online, short of shutting the Internet down entirely.

This analysis of the Internet's role in enabling a broad cultural pattern of association is obviously related to recent theories of "social capital". According to these theories, the health of a society lies fundamentally in its associations, in the cultural forms for creating associations, and in the prevailing atmosphere of trust that makes associations possible. It is also closely related to the theory of "weak ties", which measures the health of a society not in terms of a small number of strong social bonds, for example in a family setting, but rather in terms of a large number of relatively weak bonds. In each case, the idea is that a society's members can respond more effectively to opportunities and challenges when they already have a network of contacts that they can draw upon in pulling together a suitable organization. This is obvious enough in the political realm: if an issue arises in a community, for example a new source of pollution or an outbreak of corruption, citizens who are already accustomed to dealing with one another can reach out to form an appropriate collective expression of their concern. An atmosphere of trust will make this kind of organizing much easier, as will an establish network of acquaintanceships formed in the context of earlier such episodes of organizing. From this perspective, one need not be concerned if no single organization keeps the members of a society organized from week to week and year to year, so long as the society as a whole is capable of responding flexibly to issues as they arise. If the Internet lubricates this sort of spontaneous association even further, then the claimed decline in long-standing formal organizations should cause less concern. Perhaps those quasi-permanent organizations existed largely to support a network of communications channels that the Internet can now replace. In any event, it is important analytically to distinguish between association (in an informal sense) and organization (in a formal sense). The Internet can support either.

This analyses applies even more strongly in the economic realm. The point is usefully discussed in relation to an extreme example, Silicon Valley. Central to the occupational culture of Silicon Valley is the maintenance of social networks: people stay in touch with everybody they have ever worked with. Companies form and reform on a frequent basis, so that most employees can expect to search for new job every couple of years. This creates a great incentive to maintain one's social network, for example through periodic lunch meetings and e-mail messages. These networks form a powerful intelligence system within the Valley, so that everyone maintains a high degree of awareness of other companies and projects in their sector of the industry. It is also a powerful resource for entrepreneurs, who can easily pull together the right team to implement any new idea that might attract start-up capital. Silicon Valley also benefits from a remarkably developed network of so-called outsourcing firms that can rapidly provide every resource that a new company requires. An entrepreneur who has an idea and a few employees can instantly pull together office space, cubicle partitions, office equipment and staff, specialized design expertise, off-shore manufacturing, a customer service facility with trained operators, and a wide range of other support services, all of them run and paid by the

outsourcing firm under contract to the entrepreneur. Because of these complementary services, and because nearly everybody in Silicon Valley has been through a number of start-ups already, it is literally possible to pull together a new company in the space of a few days. Venture capital firms, moreover, employ a wide range of techniques for training entrepreneurs in identifying and explaining promising business techniques, so that their cognitive skills become optimized for efficient deal-making. This is truly a high level of social capital. One should not overgeneralize from the particular case of Silicon Valley, whose customs and organizational forms are highly adapted to the somewhat idiosyncratic demands of computer hardware and software. Nonetheless, the general lesson is that high degrees of self-organization are possible within a social system that develops the appropriate institutional framework and cultural forms.

If these theories are true, then the health of a society is found in a pattern of lateral ties, that is, a culture in which people look to their equals for solutions to their problems, rather than to their superiors in a social hierarchy. This does not preclude a role for government in those areas where spontaneous association does not suffice to solve a problem. But it does suggest that spontaneous association is a prerequisite to any genuine solution, whether it involves the government or not. In many countries, legacies of authoritarianism have either destroyed these cultural forms of lateral association, or else have prevented them from forming in the first place. In this kind of environment, it is no surprise that corruption flourishes, or when the economy stagnates. Such societies may see no need for the Internet, or they might view it principally as an instrument of social disruption or cultural invasion. Those fears are, of course, not completely unjustified. But a robust society with strong social networks should be able to address the problems as they arise, as well as enjoying the benefits of rapid and flexible social networking.

5 Globalization of the policy process

Globalization is not a simple phenomenon. It consists of numerous modes of interaction and interconnection among domestic polities, all of which are related in some way to changing uses of technology. As the making of foreign policy evolves, technology plays roles that are both indirect and direct. In its indirect roles, technology participates in changes in global society generally; every policy concerns specific phenomena in the world, and the phenomena themselves are becoming global in part through technology. In its direct roles, technology participates in the formal process of policy-making. It is useful to distinguish indirect and direct effects; even a state whose policy-making processes have not changed in thirty years nonetheless finds itself responding to a rapidly changing environment. At a deeper level, policy-making processes are always embedded in larger social processes; it would be disastrously misleading to consider the formal mechanisms of policy-making (committees, consultation, voting, secrecy, and so on) in isolation from the policy dynamics of the global community.

The policy-making process is becoming globalized in part because the issues themselves are becoming global in nature. The fundamental economic drivers of this globalization often pertain to information. Information products exhibit vast economies of scale, and so a company that makes such products experiences powerful incentives to market them worldwide. This includes obvious examples like software and movies, both of which benefit greatly from globalized sales. But it also includes the information and knowledge components of many other products. Automobiles, for example, are extremely knowledge-intensive goods. The design effort that goes into producing an automobile exhibits the same economies of scale as any other kind of knowledge work, and so automotive firms can only compete if they distribute their high design costs across all of the world's markets. The point is not exactly that all industries and commodities become homogenous across the entire world. The point, rather, is that the market creates enormous incentives to separate those aspects of a product or service that can be globalized from those that cannot, and to modularize accordingly. In the process, policy issues that relate to the globalized component of a product or service, or to the cross-border activities that are involved in producing and delivering them, become inherently global in nature. The same economic pressures that encourage global standardization of information technology, for example, also encourage global standardization of the laws and regulations that affect information technology.

The policy process is also becoming more global through the increased commonality of culture. This is a commonplace in regard to television, which creates a shared background of cultural references even when it is not intrinsically lofty. Global news organizations such as CNN and the BBC play an obvious role in creating a global news agenda, and the Internet affords diaspora communities increased access to news from their home countries. Foreign newspapers that can cost several dollars for a week-old edition on an urban newsstand are available instantaneously and for free online. This has been especially important in the enormous Chinese diaspora, whose appetite for online Chinese news has been voracious. Foreign students reading newspapers back home have become a common sight in Internet cafes and university computer labs worldwide. These individuals have feet in multiple cultures, often several at once, and constitute numerous points of contact between the social networks of different societies.

Do these effects add up to the emergence of a global civil society? While one can certainly speak in qualitative terms of an emerging global network of nongovernmental organizations with overlapping audiences and agendas, the effect should not be exaggerated either. Citizens have demonstrated little enthusiasm for global government, and even in the context of the European Union it would seem that citizens prefer to debate public issues in the contexts of their own language and culture, making collective decisions about how to participate as a nation in the larger federation, rather than participating in the cross-linguistic, cross-cultural debates of the European parliament. While many businesses operate on a global basis, the vast majority of businesses are still firmly grounded in their countries of origin. Many businesses, especially in the increasingly important service sector, are inherently local in nature. Thus while business and technology are certainly globalized on a large scale, nonetheless global civil society is still largely a matter for elites, and for activists who serve as bridges between the civil societies of distinct countries.

That said, numerous dynamics are working together to promote a globally integrated policy process. Many policies, for example in the area of trade, emerge through years of specialized analysis in "epistemic communities" whose members are drawn from throughout the world, or at least from the advanced countries. By the time such issues raise to the level of formal negotiation, much less treaties, legislation, and institution-building, they have already taken intellectual form through the long-term shaping and consensus-building of the epistemic communities that have worked on them full-time. This is the international dimension of a phenomenon that has already grown intense in particular countries: the "information intensity" of politics that originated with the open-government movements of the 1970s. Modern politics certainly rewards those interests who invest financially in the policies they favor, but straightforward cash payments must by complemented by a sustained investment in the ideas, theories, facts, research, rhetoric, and expert opinion that rationalizes the desired policy in the epistemic communities that define it.

The combined effect of these trends is that governments increasingly find issues taking form through global dynamics and then arriving at their borders to penetrate their own policy-making processes. A globalized policy can penetrate a domestic policy-making process in many ways. In the United States, for example, it is now common for foreign businesses and governments to lobby legislators and regulators, either directly or through American allies. Businesses might lobby a legislature for policies that make them compatible with policies in other countries, for example when they depend on technologies that must be compatible on a global basis. Domestic interests might align around an issue for global reasons, even when the formal policy process never recognizes any of those reasons in its formal deliberations.

A particularly striking current example is the European Union's Data Protection Directive, which provides that firms doing business in Europe cannot move databases of information on European citizens to countries whose privacy protections are not deemed adequate. This almost certainly includes the United States, thus setting the stage for a significant conflict. The United States has tended to treat the issue strictly as a matter of trade, as if the cross-border data flow provisions of the Data Protection Directive were principally a matter of foreign policy in the traditional way. So far as the Europeans are concerned, however, the Directive and the laws that implement it are effectively part of their constitutions. They perceive these laws as domestic policies that they have adopted for domestic reasons, and they regard the cross-border provisions simply as mechanisms to ensure that firms do not attempt end-runs around them. This clash in perceptions speaks directly to the increasingly unclear line between foreign and domestic policy, and to the interpenetration of policy-making dynamics in the two spheres.

Societies have hardly begun to reckon with the consequences of these developments. One potential consequence concerns the structure of domestic politics. If political processes are shaped by social networks, and social networks are shaped by occupational networks, then a fault line may be emerging between those citizens whose networks are primarily local and those whose networks are global. Scientists and executives of global businesses, for example, have no alternative to developing and maintaining a global professional network. They must invest much of their waking hours participating in social processes that are relatively indifferent to geography. They may be transient, moving from one city to another before they can put down roots or embed themselves in local civic life. As a result, in the United States anyway, it has been common to speak of "elites" as having disloyally given up their allegiance to the nation in exchange for a more global identity. This kind of accusation resonates all too easily with nativist and xenophobic trends, and with anti-intellectualism, but it can also reflect a legitimate concern that the many political and economic issues that truly are local in nature will be left out of account by an emerging globalized stratum of society.

The strategic consequences of these developments are clear: all political actors, whether governments or nongovernmental organizations, must take the initiative to participate in globalized policy processes. This is true even when policies are formally made by domestic bodies. Once a consensus develops among a critical mass of actors, only the most powerful actors can even expect to derail a proposed policy from taking hold on a global basis, much less

substitute another policy of their own. A legislature, for example, might be presented with a treaty that has been negotiated over several years with little public debate. Renegotiating a treaty that a legislature has rejected can take several more years, and may not succeed at all. A legislature that is taken unawares by such a treaty will experience extreme pressure to accept the treaty on a take-it-or-leave-it basis, with no meaningful chance for amendments. The parties who do participate in negotiating the treaty, whether as formal delegates or as lobbyists and advisors, know that legislatures will be placed in this position, and as a result they can be more aggressive in shaping the treaty to their liking than they could be in promoting ordinary legislation. Likewise, a nongovernmental organization that does not build coalitions in the early stages of a global negotiation may have little leverage once a consensus forms.

These dynamics may be obvious enough in the case of formal treaties, but they are also present in the context of other globalized issues. Once an epistemic community reaches a broad consensus about the shape that a policy should take, legislatures and nongovernmental organizations who have not been part of that consensus will find themselves badly behind the policy-making curve.

The solution to these problems begins with globalized social networking around policy issues, and global communications technologies such as the Internet obviously play a large role. Policy networks should ideally be built ahead of time, before any issues emerge and take shape in the public eye. Once built, these networks have to be kept in working order, and they have to be capable of responding rapidly as specific issues do emerge and evolve. Wealthier organizations such as multinational firms may well be able to track globalized policy issues by means of plane tickets and international telephone calls. For others, less expensive technologies such as the Internet are essential. The Internet is not ideal, nor is it probably sufficient, for the reasons explained above: although coalitions can be maintained through electronic mail, they are best built face-to-face.

The Internet is especially powerful as a means of distributing breaking information, for example policy documents such as treaty drafts that become available by one means or another. This example, in fact, is drawn from the case of the Multilateral Agreement on Investments, an ambitious draft treaty on the protection of international businesses investment that was withdrawn in 1998 after the release of a confidential draft led to a coordinated global campaign by public interest activist groups. These groups were fortunate in having more advance warning than they were supposed to, but in the future advance preparation will be essential. One model for the necessary effort can be found in the management literature on "issues management", which begins with a program of surveillance by which employees of an organization scan the whole of society for incipient policy issues that might affect the organization's welfare. This includes scanning the news media and other obvious components of the public sphere, of course, but it also includes monitoring the mechanisms by which issues arise well before they reach that mature form. Recently, for example, several firms have begin to market services that scan the Internet for mentions of a client's firm, thus providing an early warning of uncontrolled rumors or organized citizen activism that might affect them. Political direct-mail innovator Richard Viguerie has recently begun a firm that monitors not only the Internet but a wide range of other popular communications channels, such as talk radio, activist organization newsletters, and talks by authors in book stores. This is part of a broad trend toward the adoption of techniques from grassroots political activism by large private firms, and in an increasingly globalized policy environment many of those firms' own techniques will certainly be useful to governmental and nongovernmental political actors alike.

Advanced communications technologies will also be crucial for coordinating political action across a large number of forums. These forums include the hundreds of national and thousands of subnational governments, each which their multiplicity of agencies. But they also include a rapidly expanding sprawl of global treaty organizations. These organizations, which number many hundreds and at the present rate could easily become thousands, have grown so numerous, and their relationships have grown so complex, that a science has begun to emerge around their design. Yet they are virtually unknown to the average citizen. They range from large bureaucracies such as the United Nations, to emerging quasi-governments such as the World Trade Organization, to small, special-purpose agencies that focus on specific issues such as the preservation of polar bears. In a perfectly neat world, every issue would find a natural home in precisely one of these organizations, and governmental and nongovernmental actors alike could develop strong networks with the particular organizations where their issues are formed. Reality, though, is not so simple. Questions of jurisdiction are often uncertain, issues can fall across the borders of several institutions, and powerful players can shop for convenient forums to pursue their interests. Just as anywhere else in politics, the very choice of forum can largely determine the outcome, so that political advantage goes to those players who begin shaping the issues before they have ever become part of a formal agenda. This kind of coordinated action across forums, as well as the flexible focusing of attention and effort that globalized issue-shaping requires, will demand a sophisticated mastery of communications technology. Mastery of technology is not enough, obviously, but it will be one central component of the necessary skills.

6 Role of intermediaries

It is a commonplace that the Internet moves information from point A to point B with little regard for distance or geography, and little respect for the boundaries of organizations or the borders of countries. From the earliest days of the Internet's public visibility, therefore, analysts have focused especially on the Internet's potential as a means of circumventing intermediaries. Intermediaries, broadly speaking, are organizations that stand between individuals and structure their relationships. Stock markets, for example, serve as intermediaries between people who want to sell stocks and people who want to buy them. Banks, likewise, are intermediaries between people who have capital and people who want to borrow it. In each case, the intermediary matches parties with complementary interests, manages various aspects of the transaction, assumes a certain amount of risk, and then takes a share of the proceeds.

Well before the Internet, the term "disintermediation" arose in this financial context to name the process by which banks are being displaced by other, simpler forms of intermediaries. Nothing prevents an individual from buying a piece of commercial paper directly from a company, later selling the paper back for the original principal plus interest. Intermediaries are still usually required to match the buyer and seller of the paper, but the new intermediaries play a smaller role and typically do not assume any liability in case the borrower should default. Disintermediation is thus a somewhat misleading term, and alternative terms such as "reintermediation" have arisen to name the more general process by which processes of intermediation are restructured in the context of improved information technology.

It is important to distinguish between two roles that information technology plays in the restructuring of intermediaries. Call them the communications and processing roles. The communications role is the more obvious one: technologies such as the Internet make it easy for parties to publicize their "wants" and "haves", and then to communicate and conduct business with one another at a distance. The processing role, however, is more complicated. Intermediaries such as banks are not simply conduits for information; they also gather and process information in making their lending decisions. This is how they can afford to take risks on lenders, and it is the primary justification for their profits: profit is integrally related to risk, and risk is managed through information processing. Even if alternative means of communication are available, the basic structure of intermediation will remain the same unless individuals with capital are able to conduct roughly equivalent information gathering and processing on their own. This requires reliable information resources, information processing skills, computer power, and software. As business information services such as Bloomberg become widely available, and as processing power and financial software become plentiful, then structures of intermediation can begin to change. New markets can emerge to mediate the relationships between the new generation of sophisticated, information-intensive investors and the parties who want to borrow from them. The distinction between the communications and processing roles of an intermediary leads to some important predictions, for example, that the structure of intermediation will be systematically related to the nature and availability of information services.

Although the details are different, the analogy to intermediaries in the political arena is close. For example, it has often been argued that the Internet will eventually have a major structural impact on the electoral system, even replacing the entire institution of the legislature with some kind of plebiscite system. This idea often goes by names such as "direct democracy". Quite aside from the political merits of such a proposal, there are principled reasons to doubt whether such a transition could ever take place. The main argument for a transition to a plebiscitary system is that the Internet enables individuals to circumvent intermediaries and relate directly with the matters that concern them. This is the familiar communications role of intermediaries. What the argument for new digital plebiscites ignores is the considerable processing role of intermediaries in the political system. Even though legislatures rely largely on interest groups for detailed policy analysis, they do perform extensive analysis of their own. They also engage in knowledge-intensive negotiation activities that give shape to a bill, and in the complicated trade-offs among issues that hold political coalitions together. No plebiscite mechanism can hope to search the vast space of possible legislative formulations to find the one that produces the "best" set of provisions for a 51% coalition. It is certainly plausible that the role of the legislature will change as its communications functions improve, for example as draft bills and other documents become available online in real time. But it is still hard to imagine how these changes might lead to a qualitative restructuring.

Similar arguments apply, though less stringently, to political interest groups such as business associations and issue lobbies. These groups also play two roles as intermediaries. In their communications role, they inform their memberships of current legislative or regulatory action, as well as the current thinking of the organization's officers and members. Many organizations maintain extensive communications facilities, including magazines and fax trees, and organize elaborate internal democracies. But these organizations also provide extensive information processing services: keeping staff members on the floor of the legislature, analyzing issues and proposals, "scoring" the legislators' voting records, negotiating the details of proposed legislation with legislators and representatives of other

interest groups, and so on. This is sophisticated, skilled work, and the Internet does very little to automate it. Advanced online communications services may enable these processing tasks to be spread out more in space, but they will probably have little impact on the core tasks of negotiation, which unlike more routine communications are best conducted face-to-face. Computer processing can amplify the work of policy analysis, but the major effect of this amplification in practice has been to increase the demand for information. And as the political process accelerates, so that issues that might once have developed over months instead evolve in days of rapid-fire interaction, the need to have a staff member in the hallways only increases.

Even if the processing function of a political intermediary remains much the same, one might expect the Internet to revolutionize its communication function. Yet even here the picture is complex. Much of the communication function of a political intermediary is closely tied to the analytical and face-to-face work of its staff. An intermediary's supporters may acquire other sources of information about an issue in broad terms, but if they want to follow the details of the action, or if they want to coordinate their actions on a rapid-fire basis, then they will have little alternative to continued membership in the intermediary. Taking a cue from the splitting of financial intermediaries into a large number of focused segments, individuals with political interests might try to start their own intermediaries to address the specific issues that concern them. But they will be competing with established intermediaries whose "brand names" are well known, and which can achieve significant economies of scale in their processing functions by applying them to a broad cluster of interrelated issues.

Despite all of these qualifications, the spread of information technology can be expected to restructure many aspects of a political intermediary's work. The interface between the intermediary and the legislator may not change in a qualitative way, but the interface between the intermediary and its membership might change considerably, as might the organization's internal structure. As mentioned above, rapid-fire politics requires rapid-fire mobilization of one's membership, especially for the purpose of calling legislators as the detailed legislative action gets under way. Another issue pertains to marketing. Hard-core enthusiasts will always join political organizations, but many others may simply wish to be informed, or may want a much more abstract sense that they are supporting a good cause. Communications with this much larger audience can be revolutionized using interactive media. For example, an organization's expensive paper magazine can be placed online and customized for a given member's interests, and issue alerts and other widely distributed electronic messages can be divided into categories and sent only to those who want them. Interactive media can also be used as part of a wide range of other mechanisms for involving members in the life of the organization, for example in announcing face-to-face events with well-known supporters of the organization's views.

As this example suggests, the distinction between "online" and "offline" organizations, political or otherwise, is largely without value. Every organization should have employ the full range of available media, seeking those strategies that combine media to the best effect. Many political organizations, for example, have observed to their regret that it is nearly impossible to raise funds online. It is entirely unclear why this should be. Perhaps the younger generation who are disproportionately online are less inclined to joining and contributing to causes, or perhaps the organizations that have sought funds online have not learned how to create a deep enough sense of involvement in the organization. Given the crushing overhead of direct-mail fund-raising, the issue of online fund-raising will remain a serious concern. Every political organization faces the problem of free-riding: individuals benefit from policies whether they contributed to promoting them or not. Business associations address this problem by helping to build social networks, and by performing other sorts of intermediation besides lobbying, for example by helping to digest and interpret complex regulations as a service to their paying members. Other types of political intermediaries may be able to use the Internet to create additional services for their members as well. This is, after all, the social integration function of civil society that has been celebrated by generations of political theorists, and the Internet is surely a central part of any meaningful mechanisms of social integration in the geographically far-flung society and polity of the global era.

The Internet may also bring new internal dynamics in the day-to-day running of organizations. Many organizations consist of a centralized staff and widely distributed chapters, and in such cases the Internet enables the chapter members to communicate directly. This is truly an example of disintermediation, with the central staff serving as the intermediary for relations among the members. The results can be disruptive, with power shifting away from the centralized information-conduits and toward the (usually more militant) grass roots. This can be beneficial if it brings energy to the organization, and it and be harmful if it prevents the organization from acting in a coordinated way when rapid action is essential. In either case it will surely lead to a different organizational culture, and to a modified role for the staff.

Finally, the very notion of intermediary dissolves somewhat in the context of globalization. The classical notion of a political intermediary, the building block of civil society, is predicated on the assumption that the state is a single,

unitary organization. In the global context, as I have already observed, this is not true. As a result, a nongovernmental actor such as Greenpeace acts in many forums and serves as an intermediary for its members in all of them. The complexity of organizing communications across all of those forums may well strengthen the organization's intermediating role, even as the technology would seem to weaken it.

7 Technical directions

Even though it has been in operation since 1982, in many ways the Internet is still in the early stages of its development. Exponentially dropping prices for most of the Internet's constituent technologies ensure that the technology will find qualitatively different applications in the future. But serious obstacles remain, and few specifics about the Internet's future can be predicted with perfect certainty. I will briefly survey several areas that can be expected to influence the globalized policy-making process: local access, embedding, mobility, broadband applications, and the standardization of organizational practices.

Local access. With the price of computers dropping, the main obstacle to Internet access for a broad middle range of the world's people is the cost of a local telephone call. Telephone infrastructures in many regions are either nonexistent, technically incapable of carrying large amounts of data, or inefficiently run and consequently expensive. Every country needs to reform its telecommunications sector before the Internet can achieve its full potential. As a technical matter, two broad approaches can be distinguished. One approach is to upgrade the existing telephone system, a process that in many cases will require laying new wires or replacing outdated switches. The other approach is to build an alternative system, for example using so-called wireless local loop services that connect individual households to the network without having to run wires to each doorstep. As prices drop, wireless local loop services are becoming especially attractive for areas that lack the means to install and maintain new wires. Even so, the economics of the various approaches are still unclear. The outcome, however, will have consequences for patterns of Internet-mediated participation in politics.

Embedding. Most current Internet applications involve a full-blown computer of some sort, usually either a personal computer or a time-sharing mainframe that can support many users at once. The Internet Protocol, however, is quite capable of running on less general types of devices. Thus many manufacturers are exploring "information appliances" that might interact with the Internet without providing the full complex range of functionality of a personal computer. These special-purpose devices might be developed for narrowly defined applications in industry, or for running computer simulations of military and economic activities. The great promise of embedded Internet systems is simplicity: the aforementioned complexity of maintaining a personal computer in order to use the Internet would be replaced by a consumer appliance that is no more complex to buy and use than a good clock radio. Embedded Internet devices for use in remote regions could be inexpensive and self-contained, even disposable, assuming that a suitably restricted range of functions could be defined for it.

Mobility. Wireless data communications should make it possible for a computer to stay on the Internet regardless of its geographic location. This is a complex matter in practice, given that every Internet host needs a stable numerical address by which it can be known to other hosts. Protocols for dynamically linking a mobile computer to the nearest Internet subnetwork are in development. Once mobile Internet devices can be embedded in larger systems, it will become possible for cars and other vehicles to place their internal workings on the Internet. Individuals who participate in far-flung policy processes will thus be able to remain in continuous contact with the other participants.

Broadband applications. "Broadband applications" are those software programs that need to exchange very large amounts of data with the network. The most common example is digital television. A standard television signal requires about 6 megabytes per second of bandwidth -- about 100 times the bandwidth of the best modems for ordinary telephone lines. Audio signals, for example in telephone and radio applications, are roughly at the upper end of the bandwidth that most first-world consumers have available now. If the Internet had a million or a billion times its current capacity -- not an unreasonable scenario -- then it would be possible for anyone to transmit or receive very large amounts of data for a relatively low cost. For example, anyone could produce and distribute their own television programs. Teleconferencing might become practical due to the sheer magnitude of the available bandwidth. The consequences would be pervasive -- and very hard to predict. But is far from certain that a broadband Internet will arrive soon. One, relatively well-known problem is the "last mile" delivery of information -- a scaled-up version of the local access problems described above. A less well-known but potentially more serious problem concerns routing. The Internet routers that propel packets toward their destinations can become unstable at very high throughput rates, and nobody knows if existing designs can continue to scale up to networks that are thousands or millions of times bigger. Furthermore, the mere existence of applications that can create megabit-per-second data streams will create incentives to clog the Internet in ways that are simply not possible with relatively miniscule electronic mail messages

and Web pages. As a result, the Internet may require architectural changes to support complex forms of bandwidth pricing. It may also require more sophisticated mechanisms to control the "latency" that causes audio and video signals to break up when the network becomes congested. These are active research areas.

Standardization of organizational practices. The Internet's adoption in the consumer and business sectors has followed quite different trajectories. Although government adoption is similar to business, it remains to be seen which trajectory will best describe the nongovernmental sector. One difference is that the business sector, especially in larger organizations, has higher bandwidth. Because workplaces are grouped into large buildings, it is much less expensive to install a high-capacity network connection to a thousand business users than to a thousand separate households. But a more basic difference is that, whereas consumers are generally satisfied with simple packaged applications, businesses increasingly use the Internet to integrate sophisticated business software across organizational boundaries. This is a much harder technical and administrative problem. Business adoption of the Internet is thus a slower and qualitatively more profound process than consumer adoption. In particular, it requires that organizations standardize not only the Internet technology itself, but also the technologies that they use the Internet to connect. For example, a business that uses the Internet to connect its operations at twenty different locations suddenly has a much greater incentive to use identical software at each location, and to define all of its data items in the same way. At an even deeper level, the Internet creates incentives for whole industrial sectors to standardize both their data and their business practices. Of course, incentives for standardization of geographically far-flung operations are as old as the telegraph, if not the chariot. But the Internet greatly amplifies those incentives. But standardization of business practices across organizational borders is a deep structural change. Standardization can arise through formal committee work, through the spread of dramatically better practices from a single source, or from the economic advantages of much cheaper standardized software, among other mechanisms.

In all of these areas, the greatest danger is technology-driven progress. Technologists are often insulated from the social worlds of their users. They can easily imagine scenarios that make sense as abstract stories but that completely misrepresent the reality. Many examples of this danger can be found in the annals of research in computer-supported cooperative work (CSCW). Policy-making sounds on the surface like cooperative work, and one might set about applying common CSCW tools in the policy-making arena. CSCW researchers and entrepreneurs, however, have learned that the same online collaboration tool can behave very differently in different institutional environments. Tools such as Lotus Notes for pooling organization members' knowledge, for example, can fail to take hold if promotion mechanisms cause employees to compete against one another, thus creating incentives to keep one's own knowledge secret. Tools for keeping personal appointment calendars online and visible to one's colleagues can fail if the effort that individuals must expend to enter appointments into the calendar is not balanced by the benefits they receive in return. Tools for publicly annotating documents such as research papers can fail if negative annotations can disrupt important professional relationships, or if the effort required to compose an annotation can be more profitably spent producing the sorts of traditionally publishable documents that show up on one's resume. Every organization will need to explore these issues for itself, comparing its own experience to that of others and considering whether successful adoption of powerful new tools for online cooperation will require significant changes in organizational processes and incentives.

8 Importance of architecture

As these CSCW examples suggest, the architecture of an Internet-based system can interact with social and organizational processes in complex ways. This has true with every technology, of course, but the Internet is capable of supporting professional and political relationships in much more complex and structured ways than earlier technologies such as the telephone. Few organizations can afford to develop such applications on their own, and so most organizations must choose from among the applications that are available on the market. Those who are fortunate will find applications that are well-suited to supporting their particular pattern of interactions, both among themselves and with others. Those who are less fortunate will have to use much more generic applications, such as simple unstructured electronic mail and Web pages. These simply Internet tools are powerful, to be sure, but hardly begin to exhaust the possibilities of the medium. Because computational tools structure relationships, the architecture of these tools matters. Software is a kind of law, regulating as it does the possibilities for human relationships. Sophisticated organizations will thus monitor the development of Internet architecture, especially on the service layers that most directly structure human relationships, and will intervene in the dynamics by which architecture emerges.

System architecture can influence human relationships in many ways -- so many, in fact, that every architecture must be understood in terms of its biases. A given Internet application, for example, might support functions that are useful to one party but not another, use terminology or categories that are meaningful to one party but not another, provide only certain parties with access to information, provide some parties with information about others but not vice versa,

and so on. An application might be so expensive or laden with confusing features that only larger organizations have the means or expertise to use it. Studies of software development within organizations have suggested that the biases inherent in a new system tend to benefit whichever groups in the organization held the most political power, and this same effect may well be found in a globalized software market as well. Of course, some dysfunctional software applications will simply lose out in the market. But other applications might spread because they are useful to certain influential types of organizations, whereupon other organizations may feel compelled to adopt them in order to be compatible. This is the case, for example, with Microsoft Windows, which is far more complex and error-prone than most users need, but which continues to dominate the market because of the need for compatibility with existing Windows users.

Economic effects, including both economics of scale and the demands of compatibility, mean that nearly all software architecture evolves in the form of standards -- technologies that function the same way for everyone. Good standards are highly efficient for everyone, but bad standards can be disastrous. Sophisticated organizations will approach information technology standards strategically. If an organization adopts a "standard" that does not achieve broad market acceptance, then it will probably be impossible to get adequate maintenance or documentation, upgrade to newer versions, or remain compatible with the software of other organizations. As a result, most organizations will try to follow the market rather than leading it, paying attention to the technology choices of the other organizations with whom they most need to be compatible. An organization that has distinctive technology needs, however, may try to lead the market by promoting the development and use of a standard that is more to its liking. Such a strategy might proceed either in cooperation with an interested software vendor, or through a trade association where other organizations with similar needs can fashion a collective voice.

Sophisticated organizations will also look toward the emergence of platforms, that is, architecture standards upon which other services can be built. Some important platforms include IP itself, the Web, Microsoft Windows, and the Palm Pilot. Once a platform emerges as a standard, new applications tend to flock to it, often abandoning existing platforms that may or may not be less suitable. Most new Internet applications, for example, are developed for the Web, even though the Web's underlying protocols are not particularly efficient or well-suited for a broad range of applications. As with most standards, the emergence of a platform is largely a matter of self-fulfilling prophecy: because a platform's great virtue is its compatibility with other copies of itself, users will gravitate toward whatever platform they think is likely to attract a critical mass of other users. This is the reflexivity of the standards process, and it is an important reason for organizations to remain aware of the technical leanings of their peers.

9 Conclusion: The future of policy-making

What, then, are the consequences of information technology for the future of foreign policy-making? They are numerous and difficult to add up. They mostly amplify forces that had already been in play. They blur boundaries. Policy will increasingly arise through the interaction of activities in many different forums, and it will demand the sophisticated coordination of strategies across many forums simultaneously. Policies will emerge not so much within governments as between them and long-standing epistemic communities will arise in each policy area. The law enforcement agencies (for example, or the environmental regulators, or the economic forecasters) of different governments may be better connected to one another than they are to the other agencies within their own countries. Nongovernmental actors will need to learn a new repertoire of social skills for this much more distributed policy-making environment. Over-the-horizon anticipation of issues will become crucial, as will early networking and agenda setting. Information technology will be invaluable once the issue reaches the rapid-fire deal-making stage, but it will be useless unless a great deal of homework has been done in preparing for that stage. Stakeholders need to be informed and consulted, activists need to be positioned and trained, coalitions need to be assembled, the interactions among forums need to be mapped -- all in advance of an issue seeing the public light of day. The policy process is no longer a simple matter of consultation among governments, given the participation of diverse stakeholders in diverse forums. The world of information technology, in short, is a world of deep networking, and the future lies with whatever social system can cultivate its networks most deeply.

The rapid evolution of issues calls for different policy-making processes. The world will not stand still for a process that takes years. Instead, policy-making will have to model itself increasingly on the best practices for building software. One such principle is incrementalism: proceeding a step at a time, getting one element of software working before moving on to the next. Another such principle is open review. Modern software is so complex that no single organization commands the reality-checking resources that are needed to guarantee the quality of a program, much less to guarantee its quality on the rapid timetable that intensified market competition requires. That is why large software firms make so-called beta versions of their software available to thousands of customers for testing, and why important parts of the software industry has moved to the open source model in which the code is peer-reviewed and

freely available to all.

The issue of openness is crucial. Traditionally, domestic policy has been made in the open, whereas foreign policy has been made in secret. As the boundaries between the domestic and foreign realms starts to blur, no clear dividing line between the open and secret remains. Furthermore, the values and dynamics of an information-intensive society increasingly demand that policy be made in the open. Intelligence agencies, for example, increasingly struggle to compete with information that is available in the open literature. Intelligence is still an important part of the policy process, of course, but it increasingly consists of the integration of information from vastly heterogeneous sources. The policy process needs fewer spies and more librarians. As all policy becomes foreign, the very legitimacy of democratic government will require that foreign policy be conducted in the open. Secrecy inspires conspiracy theories. Finally, the increasingly technical nature of policy issues requires openness, because only in the context of open review by a global community of scientists and engineers can sound technical conclusions be drawn. Global society will probably never merge into a single harmonious set of interests. Conflict is inevitable. But global society increasingly governs itself in a single integrated process that happens to take somewhat different concrete form in different national capitals. This is the policy process in the world of the Internet. It is smaller, faster, and deeper than the world it replaced, but with a suitably enlightened approach it can also be more open and thus perhaps more democratic.

Acknowledgements

I appreciate the research assistance of Charlotte Lee.

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