Political Science and HCI

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What are the linkages between political science and human computer interaction (HCI)? Consideration of this question begins with an explication of political science as a field of inquiry. Political scientists study politics, in its many forms. Politics is defined in various ways, but most definitions share the central idea that politics is the process through which power and influence are used to promote certain values and interests, especially in those domains of life that are viewed as subject to legitimate public control. Political science is a set of concepts, techniques, and theories whose objective is to increase the clarity and accuracy of our understanding of politics. It seeks to describe (what is), explain (why it is), and prescribe (what should be) regarding political phenomena. Political science is a borrower discipline, adapting concepts and findings from many fields to enrich its understandings, and it is a discipline in which there is some internal debate about appropriate methods and assumptions. The dominant perspectives emphasize the use of scientific methods to produce shared knowledge about politics.

Since the early 1970s, political science has become increasingly interested in the implications of information technologies (ITs) and communications technologies for politics. There has been particular attention on analyzing the impacts of ITs on political processes and institutions, as well as the effects of ITs on individual and group political behavior. In contrast political science has engaged in little explicit consideration of human computer interaction. One way to organize a discussion of such interactions is the straightforward taxonomy presented in Table 1. It specifies the intersections between key actors whose political interactions are mediated or affected by IT. These actors are government, citizens, and business (private sector) entities. This article focuses on four of the broad interests within political science that intersect with HCI concerns: political participation in democratic systems, life in the political community, public management, and international relations.

Political Participation in Democracies

Political participation is the activity of individuals or groups who wish to influence the actions or selection of those who have political power. The activities of citizens can range from contacting government
Empirical research indicates that rates of political participation in the United States and other democratic countries are generally declining. The research also reveals that levels and types of participation are associated with the individual’s political beliefs, age, gender, socioeconomic status (SES), and unique environmental conditions. How does IT affect these patterns? There are two main perspectives in political science regarding the relationship between computing (especially networked IT) and political participation: the mobilization perspective and the reinforcement perspective.

The mobilization perspective holds that the Internet encourages participation by facilitating access to political information and providing new means to contact representatives, contribute to political campaigns, organize protest or campaign activities, sign electronic petitions, vote in elections, and so on. The Internet, in this view, enables people to

Table 1. Conceptualization of Politics: IT Linkages, with Selected Examples

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<tr>
<th>Actor</th>
<th>Government</th>
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<th>Business</th>
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<td>G2G</td>
<td>Public Management</td>
<td>G2C Public Management</td>
<td>G2B Public Management</td>
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<td>• intergovernmental relations</td>
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<td>International Relations</td>
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<td>• cyberwarfare</td>
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<td>C2G</td>
<td>Political Participation</td>
<td>C2C Political Psychology</td>
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<td>• voting</td>
<td>• deliberation</td>
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<td>• social movements, NGOs</td>
<td>• identity/group formation</td>
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<td>Public Management</td>
<td>Political participation</td>
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<td></td>
<td>• requests for government services</td>
<td>• political associations/groups</td>
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<td>B2G</td>
<td>Public Management</td>
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assemble their online worlds of political engagement on their own time and from their own homes and offices, transcending the spatiotemporal barriers that often discourage people from actively engaging in politics. To the extent IT use is not correlated with higher SES, increasing age, and male gender, it also reduces the differential impacts of these traits on higher participation.

The reinforcement perspective agrees that IT can facilitate political participation. However, from this perspective, IT primarily serves as an enabler for those who are already politically mobilized. Such people tend to be those who are advantaged in socioeconomic terms, and they also tend to be those on the advantaged side of the current “digital divide.” Thus, it is concluded that IT has actually increased the gap between those who are politically active and those who are not, thereby reinforcing existing inequalities in participation.

There is some empirical evidence in support of each perspective. On the one hand, some evidence points to the emergence of new online configurations of political mobilization. The insurgency presidential campaigns of Democrat Howard Dean in 2003–2004 and Republican John McCain in 2000 were dramatically boosted by their websites, which collected tens of millions of dollars, especially from those less politically active in offline political settings. To some extent these new participants displayed more comfort in an online political world. The human computer interaction of such websites has a significant effect. For example, Dean’s early success in fund-raising and mobilizing support were linked to a website with an attractive, easy-to-use graphical interface, enabling even inexperienced users to learn about the candidate’s positions, contribute money, read or contribute to weblogs, and organize and join local support groups. On the other hand, Richard Davis (1998) and Bruce Bimber (2003), among others, present evidence that supports the reinforcement perspective, revealing that those in positions of power or with higher SES use IT far more extensively and effectively for political purposes. Moreover, neither Dean nor McCain was ultimately successful, as other candidates with greater political resources adopted their IT strategies.

These competing perspectives point to a complex relationship between political participation and HCI. Elements of HCI can both enable and constrain particular users regarding their interactions with government and other political actors. However, what users do when computer-mediated political activity is available is not only a product of the technological and software environment. It is also contingent on political and social factors—on both psychological and structural levels—supplying IT users with reasons and differential opportunities to participate.

**Political Parties and IT**

Political parties are a key linkage mechanism between citizens and the political system. Parties serve as a communication conduit between leaders and followers, organize political information in understandable bundles, and encourage participation. Helen Margetts (2000) uses the term cyberparty to refer to political parties that actively utilize the Internet to mobilize citizens. The Internet can reach citizens at relatively low cost and thus reduce the inequalities in the capacity of different parties to link with interested individuals and groups. A large mainstream party such as the Republican Party in the United States or a fringe party such as the Natural Law Party can each maintain a constant online presence for a fraction of the cost of a national advertising campaign on broadcast media.

Also, political parties can choose to cast their message in more pointed terms over the Internet, which, in contrast to broadcast media, is seen mainly by a relatively selective segment of loyal supporters. Historically, much of the information flow has been from the party to the individual rather than fostering a rich dialogue between parties and their supporters or among supporters in ways that could facilitate greater within-party democracy. Certain HCI designs could alter this pattern. However, to this point few parties, not even cyberparties, have constructed their IT interfaces in a manner that might reduce centralized party control over either the content or functioning of the party.

**Contacting Government**

Contacting politicians or government agencies is another important source of participatory input into
the political system. Effective e-mail communications between citizens and government are an important means of citizen input into the political process. And the political responsiveness of government (G2C) is linked to its handling of citizen contacts. Recent research suggests that U.S. Congress members are struggling under a growing deluge of e-mail from constituents and other political activists and that their staffs currently cannot manage this volume of citizen input. In contrast a related survey concludes that most local elected officials in the United States not only believe they are handling the e-mail they receive but also report favorably that this e-mail helps them stay in closer touch with constituents. An important need of elected officials and government personnel is the design of automated systems that screen incoming e-mail (e.g., many elected officials will respond only to constituents) and that formulate an appropriate response based on content analysis of the message (e.g., noncontroversial replies to messages raising a policy issue or referrals to specific public agencies on requests for service).

Life in the Political Community

Other computer-mediated citizen-to-citizen activities (C2C) have significant political consequences beyond the more familiar forms of political participation. In the early nineteenth century, Alexis de Tocqueville observed a close connection between American associational life (i.e., participation in clubs, social groups, etc.) and the health of its democratic politics. Robert Putnam (2000) links a recent decline in associational life with declines in most forms of political participation. These declines have provoked substantial discussion about whether the Internet and virtual communities can invigorate or even supplant face-to-face forms of associational life.

More broadly, there is growing enthusiasm regarding online deliberation as a mechanism for shaping and discussing public policy issues. Numerous online groups have formed to discuss political events in many regions, including some sponsored by government, such as the Public Electronic Network (PEN) in Santa Monica and Network Pericles in Greece. Such online forums can expand policy discussions beyond the limited numbers who can assemble in one place at one time, and they can bring to bear considerably more extensive information and data to illuminate the topic. However, there are major design challenges around how to encourage open discussion and yet also moderate content and destructive personal attacks.

These concerns relate to at least three C2C topics at the intersection between the psychological components of political behavior and human computer interaction: how individuals acquire and process information about their political world from networked computer sources, develop and maintain online identities, and selectively attend to online content.
Collective Intelligence
The ease with which individuals can discover, create, share, and merge ideas, information, and documents online creates a fertile environment in which thinking becomes a more distributed process of cognitive interaction involving a diversity of sources and viewpoints (what Pierre Lévy [1997] refers to as “collective intelligence”) and less the product of a solitary individual. Some suggest that online political discussion, including such forms as weblogs and wikis, might result in a more productive and democratic process of opinion formation on public affairs. However, critics cite the reduced responsibility for advocacy when there is anonymity, the disconnect between reasoned deliberation and the high speed with which online exchanges typically occur, and the possibility that undesirable “groupthink” processes might actually be exacerbated by such virtual interfaces. The content on these open, relatively anarchic systems is the product of multiple, iterative, asynchronous, and distributed contributions. Thus, they raise many intriguing HCI issues concerning how to facilitate searching, integrate diverse contributions, and control content on the site.

IT and Identity Politics
The Internet mediates the cognitive interface between a user and his/her political world in ways that might have significant consequences in shaping the individual’s identity, political beliefs, and associations with others. Unlike face-to-face encounters during which identities are marked by a person’s physical presentation of self, online identities take their shape from the markers individuals choose to disclose about themselves and transmit to others. Sherry Turkle (1995) describes how, during personal website construction, the user carefully crafts and projects to the world a particular image of who he/she is. This en-
ables individuals to gain recognition from online groups with which they affiliate and even to explore socially marginalized identities. The political and social consequences of such interactions are fertile areas for further research. While some optimists see this situation as creating a new sense of freedom for users, others raise concerns that this potential undermines the ability to create meaningful identities that can be a basis for the formation of virtual communities with deep and authentic attachments. Will new graphical interfaces, streaming video, and so on be designed in ways that more directly represent the individual’s physical and personal qualities on line, and thus more closely resemble face-to-face interaction?

**Bridging and Bonding**

Finally, the Internet delocalizes users from their physical surroundings and brings them in contact with a wider online world of virtual interactions. Traditionally, newspapers and other broadcast media have served a community-creation function by providing groups of people with both a common source of information and a perspective for framing the issues of the day. Today, the Internet can operate in a similar but significantly more decentralized fashion. Far more than other broadcast media, the Internet allows a user to carve out a community of one’s choosing. This is significant for political scientists who make a distinction between interpersonal connections that foster bonding between like-minded individuals and those that foster bridging between persons and groups with divergent identities and interests.

It has generally been assumed that effective democracy, indeed any form of functional politics, needs both bonding and bridging mechanisms, but it is particularly reliant on those that bridge differences. Cass Sunstein’s (2001) survey of websites yields an image of the Web that he describes as the “daily me,” where people can surf their interests selectively, without the risk of encountering challenges to their beliefs. A subsequent study that more explicitly investigates the bridging and bonding practices of Internet users found that while most online users did both, there was a tendency to favor bonding with like-minded groups. The risks to bridging might increase as IT systems and search engines increasingly provide end users with greater capacity to select only sources and information that reinforce their preferences (that is, biases). The emerging artificial-intelligence–based systems that learn an individual’s preferences and then automatically provide only supportive materials seem even more problematic if exposure to diversity is valuable for democratic politics.

**Public Administration and Management**

Public administration is a subfield of political science that has generally considered how the public sector and its employees function to do the business of government—to make and implement policy decisions. This encompasses aspects of G2C, C2G, G2G, G2B, and B2G, as well as internal government operations.

A list of the stages of public policy analysis captures many of the crucial activities that are associated with the field of public administration. These stages are as follows: agenda setting, problem formulation, information gathering, generation and assessment of policy alternatives, policy selection, policy implementation, and evaluation. At every stage of the policy process, well-designed IT systems can provide a rich information base and powerful tools for analysis. Policymakers are increasingly reliant on computer-based search engines, databases, and decision supports that enable policy actors to measure conditions; analyze trends; undertake projections; perform modeling, simulation, and cost-benefit analyses; monitor changes; and so on. A key area of HCI challenges is the development of improved visualization techniques for data displays and data searches. The development of more powerful and multifunctional geographic information systems (GISs), viewed by some as the “killer application” in support of most stages of the public policy process, is another domain with major possibilities for HCI research. There are also many applications of computer-supported cooperative work (CSCW) and other groupware on which improved software and interfaces could enhance communication, coordination, and decision making by groups who make and implement public policy.
Government–Citizen Links
Many e-government applications emphasize G2C—applications that deliver government services to citizens, presumably in a more efficient and effective manner. Governments in advanced democratic societies, with the Scandinavian countries at the forefront, are expanding web portals that enable citizens and other clients to identify and contact the governmental unit they need in order to locate information or engage in a transaction. First-Gov in the United States and ukonline.direct.gov.uk in Great Britain are among the most ambitious national-level attempts to facilitate identification of and connection to the relevant government agency. Even nondemocracies such as China and Cuba are implementing e-gov schemes that link users with government.

A major HCI challenge is how to design user-friendly computer interfaces that enable the average citizen—an individual with only modest understanding of the complex structures and functions of government—to navigate government websites in order to locate comprehensible information and interact with appropriate agencies. There is also rapid growth in the applications that allow citizens and clients of government to complete C2G and B2G transactions online, whether paying a traffic ticket, applying for a permit, completing a government purchase order, submitting a report, or any of the myriad of operational activities that occur between government and either a citizen or a business. Thus, governments are experimenting with web portals that aim for greater ease of use by employing improved keyword search engines, frequently asked questions (FAQs), graphic displays, touch screens, and multilanguage interfaces.

Government–Government Links
In most advanced democracies, the internal administrative processes of governments—generally G2G or intragovernmental linkages are characterized by the features of a “Weberian” (after the research of sociologist Max Weber) bureaucracy. The hallmark features of such bureaucracies include hierarchal organization, specialization of labor, and specific rules of behavior insuring rational, consistent action. Such bureaucratic behavior, while generally predictable, has been strongly criticized as lacking in flexibility and responsiveness and as producing “stovepipe” agencies that fail to coordinate and share functions with each other. Thus advocates of the “new public management” envision a more flexible, cooperative, and entrepreneurial style of government administration.

Various applications of IT, especially web-based systems and other modes of information sharing, are assumed to be crucial facilitators of a reformed, increasingly virtual government in which traditional boundaries between bureaucratic units are bridged. This occurs as web-based systems result in pervasive cross-unit information sharing and more fluid forms of cooperative behavior, both vertically among actors within a unit and horizontally across units (G2G). The current obstacles to the successful design and implementation of such systems are generally grounded in bureaucratic and political resistance more than in sociotechnical issues. However, there are challenging HCI issues in the creation of functional, interoperable information systems within which data generated and used by multiple agencies with different operating routines and different information needs are of high quality, are easily shared, and increase productivity.

Government–Business Links
While e-government’s interfaces with citizens have political importance, the government–business aspects of e-gov (G2B and B2G) arguably have the greatest economic significance. Governments have extensive dealings with private businesses as both customers and suppliers, and the systems of bidding, purchasing, and payment are now highly automated. In addition many businesses are subject to government regulation and need approvals, licensing, and diverse forms of information from government. Thus, there is a particular effort to make the digital transactions between government and business more transparent, efficient, and easier to use. There are also concerns regarding authenticity, digital signatures, widespread use of Smart Cards, and so on. And given the public disclosure laws regulating government behavior, there are many challenges in insuring that privacy and confidentiality are assured at the same time as public accountability is maintained.
International Relations

Traditionally, international relations, one of the main subfields of political science, has focused primarily on the interactions between “states” (countries). It examines how individual states behave in relation to other states; how sets of states engage in a variety of cooperative, competitive, and conflictual behaviors; and how the international system of states functions. The Internet bears a special relationship to the field of international relations because its precursor was the Department of Defense’s Cold-War–era Advanced Research Project Agency program (ARPANET) to create a communications network that could survive a nuclear attack.

IT applications support some of the conventional capabilities of states in the international system. States utilize IT to manage their personnel (e.g., diplomats, military) outside of the state’s borders, to communicate with other states, to gather intelligence about the actions of other states, and to expand their capacity for engaging in conflict (e.g., weapons guidance systems).

Information Age Warfare

Recently, IT has become a much more potent force in the international system. Substantial funding involving HCI issues has been directed to creation of the “electronic battlefield.” Success in shaping the behavior of other states, both by the use force and also by the threat to use force, is increasingly linked to the state’s ability to engage in “network-centric warfare.” In this approach all members of the military force are connected to a robust and extraordinarily rich digital network of shared information. From the central field commander to the bomber pilot to the foot soldier, everyone is continuously provided with the information and visualization tools enabling each to operate with field awareness, speed, synchronization of action, lethality, and survivability that are unmatched in the history of warfare. Insuring the ease of use and the effective interfaces among all this digitized equipment for everyone in the network, as well as improving the functionality of all the smart weapons systems, provides extensive HCI challenges. The major military powers have allocated high levels of research and development support to this area. These capabilities have been applied most fully and successfully by the U.S. military in the Iraq invasion of 2003.

Globalization

More broadly, current applications of IT have been at the center of a set of technologies that are reshaping the international system. IT has dramatically increased the speed, scale, and distance at which information can be transmitted. This development has affected the world economy in powerful ways, by accelerating and intensifying the flow of goods, capital, and people and by facilitating the multinational functioning of firms. It has also affected culture and behaviors, as diverse ideas have penetrated every corner of the world. These and associated phenomena are generally summarized as globalization.

Among the most significant political impacts of globalization is the reduction of the power and autonomy of the state. Globalized IT makes it more difficult for a state to maintain its sovereignty—the right of the state to control all activities within its borders. Major economic actors (e.g., transnational corporations and international regimes such as the World Trade Organization) now use IT to manage operations that are largely unconstrained by national governments or borders. A rapidly expanding number of transborder groups and social movements are also utilizing IT to recruit members and coordinate political actions that pressure national governments or serve as alternatives to governments. These range from humanitarian groups, such as the International Campaign to Ban Landmines (whose founder received the 1997 Nobel Peace Prize for her Internet-based campaign against landmines), to violent groups, such as al-Qaeda.

Thus, sovereign states and other transborder actors are all attempting to use IT as a key resource in the competitive struggle for advantage and control within the international system. The forms of human computer interaction will be critical in determining, on any given international issue, which actors are best able to take advantage of this powerful resource. Many public and private actors are deeply concerned about such HCI-related issues as the security of their own information systems, the growing dangers of cyberterrorism, and the positive and negative uses of encryption. And many political regimes, especially
the less democratic ones like China, Singapore, and many Middle Eastern countries, struggle with the need to maintain IT interfaces that are open to the global economy but limit their citizens’ online activities and access to information.

**Stability or Transformation?**

Both political scientists and those who are engaged in HCI work share a need to understand more fully the relationships between information technology and politics. Some posit that the appropriation of information technology capabilities by political actors will produce “politics as usual” because those with political power will use that power to structure the ways in which IT is designed and applied. Others suggest that the emerging information technologies are creating new political beliefs and behaviors and new political relationships that will fundamentally reshape the interactions between governments, citizens, and private sector actors. It seems clear that those designing the interfaces between political actors and the information technology supporting those actors will contribute importantly to shaping the politics of the coming decades. It is less clear what political values the technology-in-use will serve. Will those in the HCI field be primarily influenced by issues of technical possibility and sociotechnical design? Or will they alternatively (or also) be influenced by a vision of how IT should affect political phenomena? In either case, will political scientists and HCI professionals be able to discover and be guided by a rich understanding of the implications of IT systems for politics?

*James N. Danziger and Michael J. Jensen*

**See also** Digital Government; Online Voting

**FURTHER READING**


