

Information Technology in Support of Public Deliberation

Andrea L. Kavanaugh⁺, Philip L. Isenhour⁺, Matthew Cooper⁺, John M. Carroll^{*}, Mary Beth Rosson^{*}, Joseph Schmitz[#]

⁺Virginia Tech, USA, ^{*}Pennsylvania State University, USA, [#]Western Illinois University, USA
kavan, isenhour, macooper@vt.edu, jcarroll@ist.psu.edu, mrosson@psu.edu, J-Schmitz@wiu.edu

Abstract. Increased citizen-to-citizen discussion and deliberation is an important potential of digital government initiatives. This paper presents findings from a longitudinal study of such outcomes using household survey data, focus groups and one-on-one interviews from a mature community network - the Blacksburg Electronic Village (BEV) in Blacksburg, Virginia, and surrounding Montgomery County. It addresses the questions of who is using computer networking for civic participation, what impact the Internet has on their involvement with other people and local community, and the design problems that citizens experience with local e-government initiatives. A pattern of Internet use is emerging in which local formal and ad hoc groups of interested citizens distribute information on issues of interest among themselves and use online tools to raise awareness and educate, and under some circumstances to deliberate on public policy. Modified tools are suggested to facilitate deliberation and to integrate citizen feedback more effectively into local government decision-making.

Introduction

New interactive information and communication technology (ICT) can greatly spur equal access to information and foster vibrant participatory debate (Laudon, 1977; Barber 1984; Pool, 1984; Dutton et al., 1992; Etzioni, 1992; Guthrie and Dutton, 1992; O'Sullivan, 1995; Raab et al., 1996; Schuler, 1996; CSTB, 2000; OMB, 2002; Horrigan et al., 2004). Just now, they are beginning to meet this

potential. The Internet is becoming an efficient and effective channel for government to “broadcast” civic information through web sites and listservs and exchange email with interested citizens (Patterson and Kavanaugh, 1994; Schmitz et al., 1995; Carroll and Rosson, 1996; Cohill and Kavanaugh, 1997, 2000; Lin, 2000; Nie, 2001; Norris, 2001; Kavanaugh et al., 2002; Horrigan, 2001; Kirn, 2002; Larson and Associates, 2002a, b; Horrigan, et al., 2004). Background information on issues, ideas and developments has always been essential for citizens to become aware, weigh trade-offs, and form opinions on issues of common interest.

Most online government initiatives, however, starting with early interactive technology experiments such as QUBE (cable TV) and Santa Monica's Public Electronic Network (PEN), demonstrated that it is much easier to ask for citizen input than to make effective use of it. Since those early trials, government publishing of official records, forms and other information online as well as posting of email addresses for the public to contact government representatives has increased dramatically. But these government activities consist largely of broadcasting (government to citizens) and they offer limited interaction between government and a few individuals via email. While these broadcasting activities represent important stages in promoting democracy throughout the citizenry, as they make government more transparent, they should be only the first of several stages that facilitate increased citizen awareness, engagement, and participation.

Our project seeks to re-focus the digital government discussion around factors that make for an effective democracy rather than for efficient government. We focus on citizen participation in local governance - especially, local voluntary associations - and on better ways that technology can support and facilitate the involvement of individual citizens and groups from all strata of a community.

Civic Participation and Social Ties

Civic participation encompasses a broad range of basic rights, duties and responsibilities (e.g., Davis and Fernlund, 1991). Duties of citizens are not voluntary and include attending school, obeying laws and paying taxes. In contrast, basic rights and responsibilities are voluntary and include voting, holding elected office, influencing government, practicing one's own religion, expressing what one thinks in speech and in writing, attending public meetings, serving the community, and contributing to the common good (e.g., helping neighbors and fellow citizens). It is crucial that citizens read, write, and evaluate political arguments if they are to participate in democratic decision-making processes. The aspiration for an informed, engaged populace is one of the most constant elements of democracy in America (Dahl, 1989, and others). The requirements and consequences of public education with an attendant freeing of minds underlie the protections of free speech (Meikeljohn, 1948). Democratic

theory typically envisions a system of government designed to foster deliberation just as much as it is to enhance participation (Schudson, 1992).

Deliberation differs from participation in that it involves more public discussion, negotiation, prioritizing, consensus building, and agenda setting (Barber, 1984; Coleman and Gotze, 2002; Coleman, 2003). It is a multifaceted group process, one that typically occurs in public spaces, such as voluntary associations and public meetings that transpire in what Oldenburg (1991) characterizes as "Great Good Places." For most people, citizenship is not this multifaceted and active (Pateman, 1970; Verba and Nie, 1972; Milbraith and Goel, 1982; White, 2001). Few citizens participate actively in political processes, as indicated by low voter turn out and other civic engagement indicators such as those itemized by Putnam (2000), and others. Classical political theory posits that our democratic system of government works despite ill-informed and inactive citizens. According to elite theories of democracy, this successful functioning derives from the active, well informed, participation of a minority of citizens - often referred to as political 'elites' (Lasswell, 1948; Fishkin, 1991; Bottomore, 1965; Bachrach and Baratz, 1962).

People who belong to multiple groups act as bridging ties across groups (Simmel [1908]; Wolf, 1950; Wellman, 1988) and contribute towards 'bridging' types of social capital (Putnam, 2000) - or what Granovetter (1973) calls weak social ties. Bridging (or weak) ties increase the pace and flow of information and ideas throughout a community. Citizen engagement tends to be higher in communities that have dense social networks, high levels of trust and both 'bridging' (across groups) and 'bonding' (within groups) types of social capital (or what Fischer (2001) and others refer to as 'in-bound social networks'. When people with bridging ties use communication media, such as the Internet, they enhance their capability to educate community members and organize for collective action. Communities with a rich organizational life (i.e., numerous voluntary associations) provide many opportunities for bridging social capital to develop and grow. Nie, Powell, and Prewitt (1969) found that along with social class (high SES), rich organizational life represents the economic development component that most strongly affects mass political participation. Groups educate members, both cognitively and experientially, and generate satisfaction (or spur opposition) to political action, especially in local politics (Newton, 1997).

Presently, the capability of Internet technology to facilitate deliberation is much less clear than its capability to facilitate participation - more private, passive, and individual activities. Keeping informed and participating take time, a scarce resource for the better educated, political elites and for the general populace. Much evidence suggests that the Internet can alleviate constraints of time by providing anytime/anywhere information and discussion. For these and other reasons, the Internet may serve as a medium with great potential to revive

civic participation (Milbraith and Goel, 1977; Barber et al., 1997; Davis and Owen, 1998; Wilhelm, 2000; Norris, 2001; Horrigan, Garrett and Resnick, 2004).

IT and Civic Engagement

One of the earliest 'digital' government experiments used cable TV (the QUBE system) in Columbus, Ohio in the early 1980s. QUBE demonstrated that interactive information technology can facilitate direct citizen participation in political decision-making (Arterton, 1987). Although the QUBE experiment in tele-democracy seemed to improve citizen access to decision making and to broaden participation, Arterton concluded that two-thirds of citizens still did not participate, regardless of the potential utility of this information technology. Recently, many studies found that government agencies enthusiastically adopt the Internet to communicate with citizens (Brants, 1996; Horrigan, 2001; Cook et. al., 2002; Larson and Associates, 2002a, b; Bimber, 2003). Larson and Associates (2002a) found that 88% of local elected officials used email and the Internet during their official duties; a large majority of respondents reported that email with constituents helps them to understand public opinion. But the respondents agreed that email was 'not very effective' for engaging the public in debate.

Why would the Internet as a medium for participation differ from cable TV? The Internet is distinctive because it fills a unique 'media gap' for small group communication (Tomita, 1980; Neuman, 1991). It can augment public spaces and create qualitatively new "Great Good Places" (Oldenberg, 1991) that bring groups of citizens together, and foster genuine deliberation. Moreover, existant local groups can consolidate public interests and foster deliberation which group representatives can later convey back to local government agencies. These enhanced functions of local groups may strengthen their vitality in the community. Scholars have noted other Internet features that support deliberation, specifically: interaction, horizontal communication structure, lack of government censorship, and fairly low cost (Barber, et al., 1997; Tsagarousianou, et al., 1998).

Studies regarding the citizen side of participative processes find that civic exchange has increased - at least among interested citizens - with the aid of Internet applications such as the Web, email, and listservs (Kirn, 2000; National Research Council, 2000; Norris, 2000; Carroll and Rosson, 2001; Katz et. al., 2001; Kavanaugh and Patterson, 2001; Resnick, 2001; Kavanaugh et al., 2003; Horrigan et al., 2004). According to Bandura (2000, 2002), people engage in civic life and use the Internet for civic purposes when they feel that their participation and their computer mediated communication is both worthwhile and efficacious. Bandura's argument builds on his concept of self-efficacy (Bandura, 1997) and suggests that collective efficacy would be important, as well. Collective efficacy and social trust explain much of the form and the level of civic and political activity (Seligson, 1980; Wolfsfeld, 1986; Bandura, 2002; Carroll and Reese,

2003). Bandura (2001) noted that new electronic technologies provide “vast opportunities for people to bring their influence to bear” on “collective civic action” (p. 17); however, he warned that “perceived efficacy will shape how the internet changes the face of social activism” (Bandura, 2002, p. 11).

Blacksburg and Montgomery County demonstrate that with useful ICT support, interested citizens download government information from town and county websites or listservs and they keep up to date with local news and issues (Kavanaugh et al., 2000; Kavanaugh et al., 2003). Sometimes, serving as 'weak social ties' between diverse groups, leaders or members of two or more groups forward messages from one group listserv to another. To what extent and under which circumstances do citizens get beyond information distribution activities and engage in actual deliberation such as consensus building and negotiating? Several community groups have created web sites and use them to disseminate information. While different viewpoints are represented on the web to widely varying degrees, to what extent is *discussion* that might usefully be carried out electronically in public forums lost using these conventional ICT tools?

Technology support for online deliberation and civic participation must address several questions. First, how can a broad range of citizens best use these technologies to communicate ideas and opinions about local issues? Next, how can the government effectively use technology to efficiently disseminate information and effectively manage feedback? Additionally, how can these two parallel and often independent patterns of activity be better linked and thereby aid government efforts better to enable and inform online deliberation? Lastly, how can the results of these deliberations be made more accessible to decision-makers?

ICT tools to support online deliberation can evolve in many ways. In some cases, they may be provided as part of government initiatives, as in the case of discussion boards available on government web sites. They may also be independent of, but enabled by, government initiatives. For example, a personal weblog might be used for commentary and discussion of town council meeting minutes or a zoning plan that is posted on the government site. In still other cases, they may evolve in response to a *lack* of online government initiatives, or because of perceived inadequacies of such initiatives. While analysis of requirements for enhanced tools must look at how successful online deliberation tools have evolved and are used, it also must seek to discover why connected users do not take advantage of the opportunities that the network infrastructure already provides them. Are citizens simply unaware of such tools, government-sponsored or otherwise, that are available to them? Online tools that allow users to reuse existing structures or encourage them create content in the context of existing activity ought to serve as possible remedies. For example, tools could allow citizens to create weblogs by copying and modifying templates, publish annotations to government content in their own virtual spaces, or create

discussions, chat, or weblog entries with new consumer technologies such as wireless devices in public hotspots or with camera-enabled cell phones.

Are the systems that are available to support deliberation too complex for less computer-savvy citizens? Deliberation inherently requires the creation of content, something that users accustomed to merely consuming web content may feel is beyond their reach. Minimalist tools that allow users to initiate deliberation in a way that feels like a simple extension of web browsing, while at the same time providing scaffolding to support the creation of more advanced structures seem to represent workable solutions to these problems. Focusing on web accessibility for all tools can help ensure that the technical requirements for access are minimized, allowing users who may only have dial-up connections, older equipment, or access only through public terminals to participate.

Contemporary successful discussions, mailing lists, weblogs, and similar constructs can become unwieldy over time simply because of the volume of contributions. Techniques for managing scale, relevance, and accreditation of contributions to public forums have been explored in systems such as Slashdot (www.slashdot.org) and Kuro5hin (www.kuro5hin.org) and might be applicable to civic discussions (Benkler 2002; Fiore et al., 2002). Do users who know of these opportunities and have the skills to participate just fail to see the benefits, or perhaps do they overestimate the risks of contributing to public forums? Visible mechanisms that allow decision-makers to learn from and contribute to online deliberation efforts could provide additional motivation for citizens to participate.

Security and authentication may also represent important concerns for some users. Simple id and password mechanisms, authentication based on public key infrastructure, and smart cards are approaches that offer varying degrees of confidence in the sources of contributions to public forums. However, each of these strategies presents technical and usability barriers that may discourage broad participation (Ellison, 2000). In extending prior research, we investigate factors such as awareness, skill, and motivation using surveys, interviews, focus groups, workshops and our participant observation with government officials and with community members. We also build on experience with long-term participatory design (Carroll et al., 2000) to determine requirements for - and subsequently prototype - software tools that leverage existing online and offline deliberation practices while addressing the awareness, skill, and motivation of potential users. Participatory design is the inclusion of users or user representatives within a development team, such that they actively help in setting design goals and planning prototypes (Carroll et al., 2000, p. 239). Our investigation of requirements for addressing the needs of underrepresented groups builds on prior work that examines the impacts of cultural differences in usability evaluations (Vatrapu and Pérez-Quiñones, 2003).

In prior research we also used path analysis to test a set of related hypotheses; we found the independent variables of education, extroversion, and age -

mediated by variables that represented 'bridging' or 'weak' social ties across community groups, collective efficacy (Carroll and Reese, 2003) and Internet use - explained the outcome variable of civic participation after respondents went online (Kavanaugh et al., 2005). That is, the path model showed, as with other studies, that higher education was an important predictor, along with extroversion and age, but it contributed mediating variables of Internet use for political and civic purposes and collective efficacy, and found them to significantly predict higher levels of civic participation since getting on the Internet.

Local E-Governance

The Town of Blacksburg (population about 46,000 in 2004), Virginia Tech, and the local phone company (Bell Atlantic of Virginia, now Verizon) founded the Blacksburg Electronic Network (BEV) community network during 1993. For the past decade, the BEV has served as a site for extensive research on how to get a community network "right" and has provided a replicable model and benchmark for many subsequent community networks (Patterson and Kavanaugh, 1994; Carroll and Rosson, 1996; Patterson, 1997; Cohill and Kavanaugh, 1997, 2000; Silver, 1999, 2000; Kavanaugh, 2003; Carroll and Rosson, 2001; Kavanaugh and Patterson, 2001; Kavanaugh and Schmitz, 2004; Kavanaugh et al., 2003; Silver, 2004; BEV and VCE, 2004; Kavanaugh et al., 2005).

The Town of Blacksburg (TOB) lies within Montgomery County; it has jurisdiction within town limits and governs with an elected Town Council. Some services and responsibilities of the County Board of Supervisors overlap town territory, e.g., the public library and public school systems. Virginia Tech comprises the main economic base and the primary affiliation of town residents, with a student, faculty and staff population of about 27,000 in 2004. Internet penetration within Blacksburg was 91% of the population in 2002. Most of the remaining percentage has been identified as 'second-hand' users (others get information and/or email for them), (Dunlap, et al. 2003). In Montgomery county, Internet users comprised 78% of the population in 2002 and second-hand use was also common.

The Town of Blacksburg developed a website for government information and services with training and support from the staff of BEV, which has been hosting the town site since 1993. The TOB web site (<http://www.blacksburg.gov>) functions include: access to departments, updates about town events and emergencies (Blacksburg Alert), calendar of events, forms (e.g., dog license, special use permit), publications (Town Code, Town Charter, Comprehensive Plan), job opportunities, Geographic Information System (GIS), and Town Council meeting agendas, minutes, background documentation, and staff reports. Blacksburg Alert functions as a reverse 911 system; that is, the town government can quickly contact many subscribed citizens with special messages of interest or

with emergency information (e.g., weather problems and unexpected school closings). Citizens may select from many topics that might interest them, and receive notification via email or phone.

The TOB also offers digital video streaming from its web site of recorded town councils meetings (broadcast earlier live). This archive of town council meetings can be very helpful for citizens who are not able to attend town meetings in person due to other demands on their time. Although it is well established that many more people are interested in civic affairs in a community than actually show up at public meetings – the TOB online video is not indexed in any way and thus finding relevant content (by agenda item, for example) is quite time consuming and frustrating.

The Montgomery County government also set up a web site in the early 1990s, first with help from the BEV staff and later from the school district which falls under its jurisdiction. County government contracts with several different local Internet Service Providers to provide email services for staff; this makes staff addresses inconsistent and harder to remember. As with the Town of Blacksburg, the County website (<http://www.montva.com>) includes: access to departments, calendar of events, forms and publications, FAQ to answer citizen questions online, Comprehensive Plan, and GIS. The County also provides a one-way listserv of updates on topics related to county government (budgets, meetings, transportation, etc.) and interested citizens can subscribe to any or all of these updates via email or they can view them on the county web site.

The County also has oversight of the Montgomery Floyd Regional Library (MFRL), (<http://www.mfml.org>) which serves all of Montgomery and neighboring Floyd Counties. In addition to traditional library services, MFRL provides computer services which include free public Internet access through computer labs, beginner training on Internet use, and online education resources, (e.g., GED tutorials, GIS, online versions of local newspapers, and online encyclopedia).

Research Design

We are extending findings from prior research that uses findings derived from quantitative and qualitative data using a random survey sample of households in Blacksburg and Montgomery County, from interviews (focus groups and individual and small group) with local citizens, community groups, and town and county government representatives. We also draw from extensive long-term participant observation on the part of the authors. This paper focuses on findings from focus groups, semi-structured interviews with citizens and government, and our participant-observation that are part of a larger study supported by the National Science Foundation (IIS-0429274).

The primary purpose of the focus groups (conducted in December 2003) was to explore questions with community leaders and activists about their

participation in local governance and their use of information and communication technology (ICT), including email with local government staff and elected officials and local government web content. We were also interested to learn about these engaged citizens' problems or their frustrations while using ICT for civic purposes. We also sought to learn about what ICT capabilities they would like to have in the future. We did not attempt to recruit non-activists at this point because we were not confident that non-activists were using ICT for civic purposes. Thus, we sought to understand some of the parameters framing the use of ICT by those who presently use it for civic participation. The question of why some people do not use ICT for civic participation will be addressed in a future paper as part of our larger study. We recruited participants for the four focus groups by contacting local civic organizations, business oriented groups, and ethnic groups and individuals who subscribed to local government issue listservs. A total of 13 actually participated (7 dropped out, due to sickness, exams and no-shows).

We followed up on the focus groups in late Summer/Fall 2004 using additional in-depth interviews with several active individuals in citizens groups. One of these groups is a community wide grassroots organization, known as Citizens First for Blacksburg; another is a neighborhood organization called Miller SouthSide Alliance. While these two groups represent grassroots initiatives at varying levels (community versus neighborhood), both involve citizen-to-citizen interaction and deliberation on civic issues and employ a pervasive use of information technology that yields clear outcomes from their collective action.

We also conducted individual and small group interviews with local government staff (Montgomery County, Town of Blacksburg) over a three month period during Fall 2004. We recorded most of these interviews and supplemented them with our own collective notes for additional analysis and reflection. During these interviews, staff members described their current uses of ICT, common ways they interacted with citizens, and ways that they felt information technology could better support government interaction with citizens. More information about the citizens groups, government, and others interviewed, is available on the project website (<http://java.cs.vt.edu/public/projects/digitalgov>).

Results

The citizens and citizen groups that we interviewed are using ICT for different kinds of information seeking (e.g., from government sites or email), one-on-one email with government staff or officials, broadcasting information (to each other), and for some deliberation (e.g., discussion with each other on common issues). Government representatives are concerned generally with maintaining content that is easy to find and to use and helpful to both staff users and community users. We have made several suggestions for tools modifications that might enhance

options for: 1) government interaction with citizens, and 2) citizens' interaction with each other. We summarize these recommendations below.

Citizens Groups

Community leaders: The community leaders who participated in the focus groups were well educated, activists, and experienced Internet users who were generally older, but not retired. They generally used both the Town and County websites to get information, and used email with government staff or elected officials. Several of them also acted as liaisons between government and their community group (e.g., attending public meetings and forwarding emails from "Blacksburg Alert"). Most of them served as moderators or owners of listservs for their organizations. For communication with local elected officials and government staff, the participants' first choice was generally face-to-face communication because its synchronous, immediate interaction allowed them to see the other's reactions. They generally concurred that their second choice was communication via telephone and their last choice was communication via email.

The participants usually went to the Town or County site for something specific (such as the GIS), not just for browsing. They also suggested that contact information, such as name, email or phone, be provided on web pages wherever feedback or questions are likely, and not just provided on one page within the site. This might make it easier for users to interact with appropriate staff, as needed.

Citizens First for Blacksburg: The grassroots group Citizens First (CF) led an awareness campaign regarding Town Council decisions about alternative sewer options for the Tom's Creek Basin (TCB) that eventually resulted in a landslide victory for several candidates in the 2004 Town Council elections. The controversial TCB gravity sewer option was seen by many as means to subvert the Town's Comprehensive Plan, a consensus-based document which had been developed with perhaps 2,000 citizens over several years. There was a sense among many town residents (expressed by the CF group) that the more expensive gravity sewer design would allow real estate developers to build more densely in the TCB area than the Comp Plan permitted. TOB also considered alternative designs.

After the then Town Council had only a 4-3 majority vote to incur \$2 million in debt for the more expensive gravity sewer design, it decided to amend the 5-2 vote requirement in the Town Charter (intended to promote fiscal responsibility) to only require a 4-3 majority. It also proceeded to sign a contract for construction of the controversial sewer option. When CF emailed these changes to the Town Charter and the signed contract for the controversial sewer option out to hundreds of citizens on their list, a critical mass of concerned residents coalesced to oppose these changes to the Town Charter. Coincidentally, three council seats were open for town elections in the coming months; two challengers and one incumbent campaigned opposing the rush to decide the TCB sewer issue.

While preparing for the town elections, CF leaders regularly sent out emails with detailed information about organizing activities, such as from whose front porch (e.g., “with large, but friendly dog”) to pick up and later to drop off yard signs, including phone numbers and email addresses to contact if help was needed to pick up signs. Over 200 residents assisted in leafleting, phone calling, posting signs, hosting house parties, and forwarding email. As voting day approached, CF organizers sent out detailed information about specific voting locations based on residential area, the hours for voting, the types of ID required, and how to vote by absentee ballot.

The Blacksburg Town Council Elections featured a record turnout on May 4, 2004. Moreover, the proportions of votes were almost identical at both the Municipal Building (where TCB residents vote) and at the Recreation Center where residents from other town areas vote; this suggests that the city-wide CF campaign was effective. The voters elected the three candidates supported by CF who garnered a total of 80% of the vote. The following week, the new Town Council voted to terminate the contracts, funding, and easement proceedings for the TCB gravity sewer and opted to consider further the merits of the two design options and engage in more public debate to build consensus.

The Miller South Side Alliance: (MSA) formed as a grassroots neighborhood group that was concerned with potential traffic problems after the Town announced during Spring 2002 that a contract had been awarded for the nearby construction of a new office building and parking garage. The MSA grew within a few months into a formal non-profit organization (501-3C). Their initial concerns centered around traffic but later the group developed a neighborhood master plan that they submitted to the Town in Fall 2004 for approval and formal incorporation into the Town Comprehensive Plan.

The MSA secretary did not even know how to open email when MSA was formed, but she began to send email messages to neighbors using a one-to-many strategy, and checking the Town website for relevant information. She wanted to have a group discussion arrangement (listserv, forum or chat) even just with the executive committee, but she did not know how to use these ICTs. Email has served as a source of support *and* frustration during the grassroots organizing for MSA. At first the secretary sent long emails, and re-typed long passages of content from the Town website, not knowing how to cut and paste content. Some recipients complained about their length, or didn't seem to be reading them completely. She later learned how to attach documents to minimize length, but some people complained that they couldn't receive attachments. Eventually she learned how to type links to online content into her email messages which reduced length of emails and avoided problems with attachments.

There was much deliberation among neighbors in person, by phone, and online during the process of debating the potential traffic problems and the development of a master neighborhood plan. People did not always agree, but their views were

conveyed to the secretary for the record and shared with others. Some neighbors argued that their taxes would be increased if neighbors sought new traffic controls. The neighborhood master plan and the traffic initiative were sometimes at odds with each other. There was concern among some neighbors that the neighborhood plan would divert the Town's attention from the traffic initiative.

The MSA secretary credits the Internet with sustaining the group over the two and half years since its inception. Without computing, it would have been impossible to keep track of who was doing what. Computing helped to galvanize neighbors and to educate them on grassroots issues and official procedures to address grievances. After more than a year of official and residential deliberation about traffic control, including innumerable emails among neighbors, surveys of residents, neighborhood meetings and public hearings, the MSA traffic control petition was denied by the Town because their survey lacked a required response rate of 67% in favor of the traffic control measures; the MSA survey had "only" a 64% favorable response rate for new controls. However, the MSA neighborhood master plan was completed and submitted to the Town in Fall 2004 for approval and integration into the Town Comprehensive Plan. Because the traffic safety concerns were incorporated into the neighborhood master plan, they are likely to become "blessed" by the Town Comprehensive Plan.

Government Groups

The Town of Blacksburg: TOB has enhanced and integrated some of its online content to allow interested citizens and groups to find and use information. While the TOB had been posting agendas of town council meetings for several years, in Summer 2004, it began linking background documentation from each related agenda item (e.g., an agenda item about a special use permit would be linked to the completed permit application under consideration). Thus, citizens could access the same documents that town council members had used for their meetings. The TOB Comprehensive Plan and the GIS system are also integrated online; this facilitates comparing these two records (e.g., current and planned land use, zoning, and ownership). The "Blacksburg Alert" service provides a useful mechanism for the TOB to broadcast information to citizens. Although it is a one-way medium, broadcasted information can stimulate public deliberation particularly when it goes to an interested group of stakeholders, such as neighborhood or homeowners associations, like the MSA. Alert information can also stimulate second-order communication efforts when a representative or liaison citizen subscribes and forwards the alerts to others in their group(s).

Montgomery County: Discussions with the County government revealed that the Planning Department stimulated important citizen-to-citizen deliberation when it began a two-year development process for the county-wide Comprehensive Plan for 2025. In this case, ICT played an important role in this process, by

reinforcing face-to-face meetings and discussions printed in county newsletters. The government reported that information technology helped to attract broader citizen participation in the planning effort, including participation from members of underrepresented populations (i.e., lower education or income).

An initial series of face to face meetings convened by the county to develop this Comp Plan of 2025 began in 2000; these meetings were only attended by about ten individuals at each meeting. The county staff member responsible for this process decided that major communication strategy changes were essential to reach a broader and more diverse population, especially persons with less education or income. She changed the language and the style of the county newsletter to be much simpler (less jargon), more educational (explaining what county documents and input processes existed), and she used a more graphical format (to catch attention and convey complex information more effectively through pictures, tables and graphs).

The County staff worked closely with representatives from 88 local organizations (out of a total of 300 contacted) to boost citizen participation in the Comp Plan development. Group representatives received special training to facilitate face-to-face deliberation within their own organizations about the issues to include in the Comprehensive Plan and met in county work-groups throughout the Summer 2003 to do the actual writing. Throughout this intensely participative process, the Planning Department maintained a website that archived a record of feedback from citizens garnered from face-to-face meetings, emails, and telephone calls. The site also archived drafts and latest revisions of Comp Plan sections for further comments and feedback. Each background document, consultant's report, survey data finding, and even the raw data were posted on the County website. Staff even re-typed and posted citizen email messages (anonymously). Although not all county residents could access the Internet, especially persons with lower education or income, staff members were careful to keep online content accessible for those with slower access via dial-up connections. County staff received comments from some residents that their trust and confidence in the county's willingness to listen and respond to their feedback had increased because the web site reflected residents' input.

Preliminary Requirements Analysis

As citizens have come to expect a greater range of on-line government services, government agencies have, perhaps not surprisingly, grown somewhat more risk-averse in their information technology efforts. Among the factors fueling this trend are legal implications of allowing public creation of content on official systems, security concerns, the overhead of rigorously validating and subsequently maintaining each new tool deployed. Limited technology resources are focused on providing the kinds of basic information dissemination and

customer service that citizens increasingly expect. Even the most innovative government organizations are subject to these constraints. Given that it may be neither practical nor desirable to host systems that directly support citizen deliberation on government servers, our design efforts will follow two interdependent, but separate, paths: 1) analysis of design guidelines and patterns for government-provided information, and 2) prototyping of tools that citizens can use for deliberative activities.

For systems maintained by government agencies, we intend to focus primarily on issues of accessibility and complementarity with the tools that are likely to be employed by citizens, rather than proposing significant modifications to current infrastructure. Facets of complementarity include ensuring that content is published in open, accessible formats and is easily addressible. Citizens who wish to discuss a section of, for example, a comprehensive plan should be able to point their readers to the specific section. Conversely, users who wish to discover where deliberation of the plan is happening should have access to tools that track and aggregate citizen discussions. Such tools would likely be useful for both citizens and government officials, as they could help uncover proposals or events that were generating “buzz,” identify synergies among community groups, and give greater exposure to “political entrepreneurs” who bring new ideas into the conversation. Emerging standards such as “TrackBack” are designed specifically to support this type of bi-directional linking and aggregation (<http://www.movabletype.org/trackback/>). As the volume of government and citizen-created content grows, syndication mechanisms such as RSS (Really Simple Syndication), provide a flexible way to publish summaries of recent contributions and updates.

Several specific ideas for such technology enhancements have emerged from discussions with Town and County government personnel. For example, the meetings of both the Blacksburg Town Council and the Montgomery County Board of Supervisors are videotaped and televised on a community channel. Agendas, summaries, and digital video are posted to the web. (Blacksburg currently makes video available online, while the County plans to do this in the future.) The video captures details that may be missing from a summary, but, aside from the general unwieldiness of video, it is difficult to address and link to specific segments of a video stream. Technology that added this capability could make published summaries more useful, as citizens would be able to scan the meeting agenda for items relevant to their interests and click on a hyperlink that would take them directly to the video segment they wish to review. This would also allow citizens to post on weblogs or forums, to point readers to specific events in meetings, or to bookmark video segments.

In another example, the Montgomery/Floyd Regional Library (MFRL) serves as a source of authoritative information that is likely to be useful in deliberative activities. The MFRL recently begun to take a more active role in managing their

web presence, but would still like to find easier ways to update web pages that change rapidly, such as news items and upcoming events, in ways that allow them to distribute this work across the library staff. Wiki-style tools could support these authoring tasks, while RSS could make new content more visible and accessible.

In designing tools specifically for use by citizens, our interest is to facilitate the entry of new participants and to support the discovery of new ways of combining components that support core dissemination and deliberation tasks. In our prototyping activities we use software infrastructure previously developed for the NSF-sponsored TeacherBridge (ROLE; REC-0106552) and Learning in Networked Communities (LiNC; REC-9554206) projects. In the LiNC project, we developed CORK (Content Object Replication Kit), a toolkit for transparently replicating Java objects, as a basis for tools that allowed synchronous and asynchronous collaboration (Isenhour, Rosson, and Carroll 2001). We subsequently extended this work by creating a system called BRIDGE (Basic Resources for Integrated Distributed Group Environments), which provides mechanisms for browsing and modifying structured collections of CORK-based objects from web browsers and interactive clients. In the TeacherBridge project, a number of local K-12 teachers are using BRIDGE-based tools to create content such as secure web-editable pages for course management; interactive chat rooms for literature discussions; threaded discussions for persuasive writing exercises; and synchronous workspaces for distributed group projects. These creations are web-accessible, interactive, shareable, reusable, and have been created or adapted by users with a wide range of computer skills.

Discussion

Public deliberation tends to occur, as prior studies have shown, among people with higher levels of education and extroversion, and at a middle life cycle stage. These are also strong predictors of multiple group memberships and of Internet use for civic and political purposes. The focus group participants, the MSA neighborhood association members, and Citizens First for Blacksburg organizers were all community leaders with multiple group affiliations who used the Internet for civic engagement. The unique feature of the Internet among information and communication technologies is precisely its multipoint-to-multipoint capability to support and facilitate group interaction. Group meetings and public places provide the 'great good spaces' where much deliberation occurs and social capital accumulates. Several studies show that Internet household penetration throughout the US has risen steadily (Horrigan, 2001; Horrigan, et al., 2004; Madden, 2003) and almost two-thirds (62%) of Americans report that the Internet had become part of their daily routine (Hoffman, et al., 2004). This means that the high Internet penetration rates in Blacksburg, Virginia and surrounding Montgomery County are no longer so unusual. Rather, Blacksburg and Montgomery County

offer a view to the near future for other American small towns and their surrounding rural counties with similar socio-economic characteristics (i.e., predominantly middle class).

Bearing in mind Bandura's warning that perceived efficacy will shape how the Internet changes the face of social activism, we can expect that citizens with lower socioeconomic status (SES) will not be drawn into local governance simply because government information is available online. The collective and political efficacy of people with lower education or income will increase only as they learn hopefulness through, for example, demonstrated and persistent government interest in their concerns (as in the case of the County Comprehensive Plan development). Incentives to participate in discussion are also greater when other like-minded cohorts are present. As such, it is especially important for these underrepresented groups that ICTs are easy to use and that their design simplifies the effort to produce online content and to participate in online discussion. While there may be other ways that intrinsic motivation to participate in public deliberation can be generated, we focused on some of the most salient factors that have been identified in prior studies and our own research. It is important to explore motivations to participate further.

Online tools designed to facilitate deliberation require that they be web-accessible, interactive, shareable, reusable, and have been created or adapted by users with a wide range of computer skills. Hence, while new end-user tools will need to be designed as requirements for deliberation systems emerge, their development can proceed from a proven software infrastructure base.

Our experiences with TeacherBridge have served to validate a key assertion about the value of component-oriented systems for end-user authoring: Rather than attempting to design the "right" system, we should seek to provide components that allow useful constellations of tools to emerge. These will first be discovered by the more innovative users (or, perhaps, those with the greatest perceived needs), and can then be copied by the broader user community. To some degree this mirrors the evolution of tool use that has already occurred in groups such as the MSA. We are building on the current set of BRIDGE components to provide easily configurable and composable threaded discussions, weblogs, wikis, polls, interactive chats, and other tools that can be used by citizens to augment mailing lists, static websites, and similar technologies already in use.

While the capability to construct new kinds of tools to meet specific needs will appeal to users who have appropriate combinations of innovativeness, motivation, technical savvy, and available time - inclusiveness demands simplicity. Ideally, users who are less comfortable with technology and, perhaps, only have network access in public places such as the library, must also be able to contribute. The goal of minimizing barriers to entry for new users has implications not only for usability of deliberative components, but also for security and authentication.

In our work on the TeacherBridge project, we have been able to provide a growing set of templates, collections of components that can be instantiated for a specific task and then customized if the user desires. For example, a template for a class home page might have a calendar for deadlines and events, standard pages for class descriptions, a contact page for parents, and a secure threaded discussion for class members. We envision similar templates emerging for organizations such as a neighborhood planning group, where the collection might contain pages for describing the organization and neighborhood to new residents, a secure wiki for drafts of planning docs, and a set of weblogs for neighborhood members. The ability to instantiate such a template via a simple user interface may encourage more organizations to become engaged in open deliberation.

Openness, in the sense of public visibility for deliberative contributions, is critical for building consensus across organizations and providing feedback to government agencies. However, the appropriate configuration of read- and write-access will vary from group to group and user to user. Systems should therefore support multiple models of ownership, membership, and editorship and they should represent systems that range from single-citizen weblogs with open comment sections, to members-only forums, or to edited neighborhood journals in which many may contribute but final publication is at the discretion of the owner.

Requirements analysis for prototyping efforts is still in an early stage. Our emphasis on flexible component-oriented systems allows us to explore a number of fundamental design questions in the context of deliberation. Given flexible components, what kinds of “deliberative structures” emerge? What are the implications of different discussion structures encouraged/enforced by tool selection and security policies? For example, there are ongoing debates as to the usefulness of comments in weblogs, with some arguing that referer tracking and Trackback is more useful: People are free to respond to an entry, at any length they choose, on their own weblog, in such a way that readers can find a link to the external comments. This approach eliminates the inherent problems of an open comment section, but requires considerably more effort on the part of the commenter. Examining questions such as this in the context of a live, diverse system also provides insights into the way credibility evolves in online communities whose members are likely to work together, attend the same church, see each other at the grocery store, or send their children to the same school.

Acknowledgments

We are grateful for support from the National Science Foundation Digital Government award (IIS-0429274) for the research described in this paper. We would like to acknowledge our research collaborators Manuel Pérez-Quñones and Daniel Dunlap and our project partners the Town of Blacksburg and Montgomery County, as well as various citizens groups.

References

- Arterton, F.C. 1987. *Teledemocracy: Can technology protect democracy?* Newbury Park, CA: Sage Library of Social Research.
- Bachrach, P. and Baratz, M. 1962. Two Faces of Power. *American Political Science Review* 56: 947-52.
- Bandura, A. 1997. *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. 2000. Exercise of human agency through collective agency. *Current directions in psychological science*, 9 (3), 75-78.
- Bandura, A. 2001. Social cognitive theory: An agentic perspective. *Annual review of psychology*, 53, 1-26.
- Bandura, A. 2002. Growing primacy of human agency in adaptation and change in the electronic era. *European Psychologist*, 7 (1), 2-16.
- Barber, B. 1984. *Strong democracy*. Berkeley: University of California Press.
- Barber, B., Mattson, K., and Peterson, J. 1997. *The state of 'electronically enhanced democracy:' A survey of the Internet*. New Brunswick, NJ: Walt Whitman Center of the Culture and Politics of Democracy.
- Benkler, Y. 2002. Coase's Penguin, or, Linux and the Nature of the Firm. *Yale Law Journal*, 112 (3), 369 - 447.
- Bimber, B. (2003). *Information and American democracy: Technology in the evolution of political power*. NY: Cambridge University Press.
- Blacksburg Electronic Village and Virginia Cooperative Extension. 2004. Getting Rural Virginia Connected. *Final Grant Report (51-60-01007)*, US Department of Commerce, TOP Program.
- Bottomore, T.B. 1965. *Elites and Society*. New York: Basic Books.
- Brants, K. 1996. An Exercise in Local Electronic Democracy. *Media, Culture and Society*, 18, 233-247.
- Carroll, J.M. and Rosson, M.B. 1996. Developing the Blacksburg Electronic Village. *Communications of the ACM*, 39 (12), 69-74.
- Carroll, J.M. and Rosson, M.B. 2001. Better home shopping or new-democracy: Evaluating community network outcomes. *Proceedings of CHI 2001: Conference on Human Factors of Computing Systems*. (Seattle, WA; March 31-April 5). NY: ACM, 372-379.
- Carroll, J.M. and Reese, D. 2003. Community collective efficacy: Structure and consequences of perceived capacities in the Blacksburg Electronic Village. *Hawaii International Conference on System Sciences, HICSS-36* (January 6-9, Kona).
- Carroll, J.M., Chin, G., Rosson, M.B., and Neale, D.C. 2000. The development of cooperation: Five years of participatory design in the Virtual School. *DIS 2000: Designing Interactive Systems*. New York, ACM, 239-251.
- Cohill, A. and Kavanaugh, A. 1997, 2000 (revised edition). *Community Networks: Lessons from Blacksburg, Virginia*. Norwood, MA: Artech House.
- Coleman, J. 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94: 95-120.

- Coleman, S. 2003. *A Tale of Two Houses: The House of Commons, the Big Brother House and the people at home*. London: The Hansard Society.
- Coleman, S. and Gotz, J. 2002. Bowling Together: Online public engagement in policy deliberation; <http://bowlingtogether.net>
- Computer Science and Telecommunications Board (CSTB). 2000. *Information Technology Research for Federal Statistics*. Washington, DC: National Academy Press.
- Cook, M. Lavigne, M. Pagano, C. Dawes, S. and Pardo, R. 2002. Making a Case for Local E-government. Center for Technology in Government, SUNY Albany.
- Dahl, R. 1989. *Democracy and its critics*. New Haven, CT: Yale University Press.
- Davis, J. and Fernlund, P. 1991. *Civics: Participating in our democracy*. New York: Addison-Wesley.
- Davis, R. and Owen, D. 1998. *New media and American politics*. NY: Oxford University Press.
- Dunlap, D., W. Schafer, J.M. Carroll and D.D. Reese. 2003. Delving deeper into access: Marginal Internet usage in a local community. Paper presented at HOIT (Home Oriented Informatics and Telematics), Irvine, CA.
- Dutton, W., Wyer, J. and O'Connell, J. 1993. The Governmental Impacts of Information Technology: A case study of Santa Monica's Public Electronic Network. In R. Banker, R. Kauffman and M. Mahmood (eds.) *Strategic information technology management*. Harrisburg, PA: Idea Group.
- Ellison, C. 2000. Naming and certificates. In *Proceedings of the Tenth Conference on Computers, Freedom, and Privacy*. pp. 213-217. ACM Press.
- Etzioni, A. 1992. Teledemocracy: Ross Perot left the residue of a good idea behind him: The electronic town meeting. *Atlantic* (October), 34-39.
- Fiore, A., Tiernan, S., Smith, A. 2002. Observed Behavior and Perceived Value of Authors in Usenet Newsgroups: Bridging the Gap. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. pp. 323-330. ACM Press.
- Fishkin, J.S. 1991. *Democracy and deliberation*. New Haven, CT: Yale University Press.
- Granovetter, M. 1973. The Strength of Weak Ties. *American Journal of Sociology*, 78:1360-80.
- Guthrie, K. and Dutton, W. 1992. The politics of citizen access technology: The development of public information utilities in four cities. *Policy Studies Journal*, 20, 574-597.
- Hoffman, D., Novak, T. and Venkatesh, A. 2004. Has the Internet become Indispensable? *Communications of the ACM*, 47 (7), 37-42.
- Horrigan, J. 2001. *Online communities: Networks that nurture long-distance relationships and local ties*. Pew Internet and American Life Project; <http://www.pewinternet.org>.
- Horrigan, J., Garrett, K. and Resnick, P. 2004. The Internet and Democratic Debate. Pew Internet and American Life Project; <http://www.pewinternet.org>.

- Isenhour, P.L., Rosson, M.B. and Carroll, J.M. 2001. Supporting Interactive Collaboration on the Web with CORK. *Interacting with Computers*, 13, Special Issue on Interfaces for the Active Web, pp. 655-676.
- Katz, J., Rice, R. and Aspden, P. 2001. The Internet, 1995-2000: Access, civic involvement, and social interaction. *American Behavioral Scientist* 45 (3), 405-419.
- Kavanaugh, A. 2003. When Everyone is Wired. In J. Turow and A. Kavanaugh (eds.) *The Wired Homestead: An MIT Press sourcebook on the family and the internet*. Cambridge, MA: MIT Press, pp. 423-437.
- Kavanaugh, A., Cohill, A. and Patterson, S. 2000. The Use and Impact of the Blacksburg Electronic Village. In A. Cohill and A. Kavanaugh (Eds.), *Community Networks: Lessons from Blacksburg, Virginia*. Norwood, MA: Artech House, pp. 77-98.
- Kavanaugh, A. and Patterson, S. 2001. The Impact of Community Computer Networks on Social Capital and Community Involvement. *American Behavioral Scientist*, 45 (3): 496-509.
- Kavanaugh, A. Reese, D.D., Carroll, J.M., and Rosson, M.B. 2003. Weak Ties in Networked Communities. In M. Huysman, E. Wenger and V. Wulf (Eds.) *Communities and Technologies*. The Netherlands: Kluwer Academic Publishers, pp. 265-286.
- Kavanaugh, A. and Schmitz, J. 2004. Talking in Lists: The consequences of computer mediated communication on communities. *Internet Research Annual*, 1, 250-259.
- Kavanaugh, A., Carroll, J.M., Rosson, M. B., Reese, D. D. and Zin, T.T. 2005. Participating in Civil Society: The case of networked communities. *Interacting with Computers* 17, Special Issue on Designing for Civil Society, pp. 9-33.
- Kirn, K. 2002. Building Social Capital on the Web: The case of Minnesota E-Democracy. In Turow, J (Ed.), *Energizing Voters Online: Best Practices from Election 2000*. Report no. 39, Annenberg Public Policy Center, University of Pennsylvania.
- Larson, E., and Associates. 2002a. *Digital Town Hall: How local officials use the Internet and the civic benefits they cite from dealing with constituents online*. Pew Internet and American Life Project; <http://www.pewinternet.org>.
- Larson, E., and Associates. 2002b. *The Rise of the E-citizen: How people use government agencies' web sites*. Pew Internet and American Life Project; <http://www.pewinternet.org>.
- Lasswell, H.D. 1948. *The Analysis of Political Behavior: An empirical approach*. London: Routledge and Keagan Paul.
- Laudon, K. 1977. *Communication Technology and Democratic Participation*. NY: Praeger.
- Maddux, M. 2003. America's Online Pursuits: The changing picture of who's online and what they do. Pew Internet and American Life Project; <http://www.pewinternet.org>.

- Meikeljohn, A. 1948. *Political Freedom: The constitutional powers of the people*. New York: Harper and Row.
- Milbraith, L. and Goel, M. 1982. *Political participation: How and why do people get involved in politics?* 2nd edition. New York: University Press of America.
- National Research Council. 2000. *Digital Democracy: Exploring the promise of information technology in promoting participation in the political process*. Washington, DC: The National Academies.
- Neuman, R. 1991. *The Future of the Mass Audience*. New York: Cambridge University Press.
- Newton, K. 1997. Social Capital and Democracy. *American Behavioral Scientist*, 40 (5), 575-586.
- Nie, N. 2001. Sociability, interpersonal relations, and the Internet: Reconciling conflicting findings. *American Behavioral Scientist* 45 (3), 420-435.
- Nie, N., Powell, G., and Prewitt, K. 1969. Social structure and political participation: Developmental relationships, Part I, II. *American Political Science Review* 63: 361-378, 808-832.
- Office of Management and Budget (OMB). 2002. *E-Government Strategy: Simplified delivery of services to citizens*. Washington, DC.
- Oldenburg, R. 1991. *The great good place: Cafes, coffee shops, community centers, beauty parlors, general stores, bars, hangouts, and how they get you through the day*. New York: Paragon House.
- O'Sullivan, P. 1995. Computer networks and political participation: Santa Monica's teledemocracy project. *Journal of Applied Communication Research* 23, (May), 93-107.
- Pateman, C. 1970. *Participation and democratic theory*. Cambridge, UK: Cambridge University Press.
- Patterson, S. 1997. Evaluating the Blacksburg Electronic Village. In A. Cohill and A. Kavanaugh (eds.) *Community Networks: Lessons from Blacksburg, Virginia*. Norwood, MA: Artech House, pp. 59-75.
- Patterson, S. and Kavanaugh, A. 1994. Rural Users Expectations of the Information Superhighway, *Media Information Australia*. 74 (November), 57-61.
- Pool, I. de Sola. 1984. *Technologies of freedom*. Cambridge, MA: Harvard University Press.
- Putnam, R. 2000. *Bowling Alone: The collapse and revival of American community*. NY: Simon and Schuster.
- Raab, C., Bellamy, C. Taylor, J., Dutton, W., and Peltu, M. 1996. The Information polity: Electronic democracy, privacy, and surveillance. In W. Dutton (Ed.) *Information and communication technologies: Visions and realities*. New York: Oxford University Press.
- Resnick, P. 2001. Beyond bowling together: Sociotechnical capital. In John M. Carroll (ed.) *Human Computer Interaction in the New Millenium*. Reading, MA: Addison-Wesley, pp. 647-672.

- Schmitz, J., Rogers, E., Phillips, K., and Paschal, D. 1995. The Public Electronic Network (PEN) and homeless in Santa Monica. *Journal of Applied Communication Research* 23, (May) 26-43.
- Schudson, M. 1992. The Limits of Teledemocracy. *The American Prospect*. Fall: 41-45.
- Schuler, D. 1996. *New community networks: Wired for change*. New York, NY: ACM Press.
- Seligson, M.A. 1980. Trust, efficacy and Modes of Political Participation: A study of Costa Rican peasants. *British Journal of Political Science*, 10, 75-98.
- Silver, D. 1999. Localizing the global village: Lessons from the Blacksburg Electronic Village. In B. Browne and M. W. Fishwick (eds.) *The Global Village: Dead or Alive?* Bowling Green, OH: Popular Press, pp. 79-92.
- Silver, D. 2000. Margins in the wires: Looking for race, gender, and sexuality in the BEV. In B. Kolko, L. Nakamura, and G. Rodman (Eds.) *Race in cyberspace*. London: Routledge, 133-150.
- Silver, D. 2004. The Soil of cyberspace: Historical archaeologies of the Blacksburg Electronic Village and the Seattle Community Network. In D. Schuler and P. Day (eds.) *Shaping the Network Society*. Cambridge, MA: MIT Press, pp. 301-324.
- Simmel, G. [1908] Group expansion and the development of individuality. In Donald Levine (ed.), *Georg Simmel on individuality and social forms*. Chicago: University of Chicago Press, 1971.
- Sproull, L. and Kiesler, S. 1991. *Connections: News ways of working in networked organizations*. Cambridge, MA: MIT Press.
- Tomita, T. 1980. *The Media Gap Model*. Tokyo: Japan Ministry of Communications.
- Tsagarousianou, R., Tambini, D. and Bryan, C. (eds.) 1998. *Cyberdemocracy: Technology, cities and civic networks*, London: Routledge.
- Vatrapu, R. and Pérez-Quñones, M. 2003. *Culture and International Usability Testing: The effects of culture in structured interviews*. Virginia Tech MS Thesis of R. Vatrapu; <http://scholar.lib.vt.edu/theses/available/etd-09132002-083026>
- Verba, S. and Nie, N. 1972. *Participation in America: Political democracy and social equality*. NY: Harper and Row.
- Wellman, B. and Berkowitz, S.D. (Eds.) 1988. *Social Structures: A network approach*. New York: Cambridge University Press.
- White, C. S. 1997. Citizen participation and the Internet: Prospects for civic deliberation in the information age. *The Social Studies*, January/February: 23-28.
- Wilhelm, T. 2000. *Democracy in the Digital Age*. New York: Routledge.
- Wolff, K. 1950. *The Sociology of Georg Simmel*. New York: The Free Press.
- Wolfsfeld, G. 1986. Evaluational Origins of Political Action: The case of Israel. *Political Psychology*, 7, 767-788.