CYBERINFRASTRUCTURE FOR SOCIAL ACTION ON NATIONAL PRIORITIES

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Extensive research is needed to build upon currently used media and tools to foster wider participation, address national priorities, and deal with potential dangers associated with technology-mediated social participation.

In recognition of the growing significance of online communities, social media, and user-generated content, *Time* magazine proclaimed its Person of the Year in 2006 to be "you." Just as the declaration of the computer as *Time*'s 1982 Person of the Year foreshadowed the personal computer's ubiquity in everyday life, we believe this symbolic award is a harbinger of vast technological and societal changes that will unfold over many years.

As the Internet and mobile technology have become increasingly ubiquitous, they have also become more social. As of spring 2010, 40 percent of adults age 30 and over, 72 percent of young adults, and 73 percent of teens use social network sites, with year-over-year time spent on Facebook increasing by 566 percent.[1] In fall 2009, 19 percent of Internet users reported using Twitter, up from 11 percent in winter 2008.[2] As of February 2010,[3] Twitter users were generating 35 million messages (tweets) per day. Wikipedia has more than 12 million registered users and more than 3 million content pages. Many examples of vibrant communities have emerged on the Web, as well as novel forms of social-computational systems such as prediction markets, collaborative filtering, social bookmarking, online auctions, and network-based peer-production systems.

A GRAND OPPORTUNITY

Something very powerful is evolving, and, as the collection of authors and articles in this special issue attest, this phenomenon is attracting the attention of an astonishingly diverse set of researchers, practitioners, policymakers, and businesspeople. During these early stages of evolution, there is enormous opportunity to harness and shape technology-mediated social participation (TMSP) systems.

From early visions of social participation in cyberspace[4] to current discussions about open government, participation, and collaboration,[5,6] there is a growing awareness of the potential to revolutionize personal communications, organizational work life, and online communities. We believe that TMSP can be harnessed for remarkable social benefits, especially as related to national priorities. Existing social media technologies, often designed for discretionary and playful activities, can be redesigned and repurposed to produce profound transformations in healthcare, community safety, disaster response, lifelong learning, business innovation, energy sustainability, environmental protection, and other important national priorities.

Current designs for social media such as wikis, blogs, microblogs, forums, social networking, media sharing, product/service reviews, and virtual worlds are an excellent starting point. However, extensive research is needed to build upon these media and tools to foster wider participation, support increasingly sophisticated interaction and accomplishments, and address potential dangers.

We believe that effective TMSP designs can improve usability and sociability to better engage people with diverse motivations, experiences, perspectives, skills, and knowledge and to create the conditions for citizens to participate, connect, and undertake constructive action. The goal is to create new architectures for the online public spaces that energize the population to contribute to vital community and national projects.

New technologies, of course, often bring new dangers. For instance, a report from the Simon Wiesenthal Center titled "Digital Terrorism and Hate 2010" indicates that people propagating hateful, racist, or terrorist ideas and activities are using some 11,500 websites, forums,

and social networks—a 20 percent increase over 2009.[7] Other potential dangers include privacy invasion, breakdowns during disasters and peak energy loads, malicious attackers, misguided rumors, undue influence from small groups, and failures to achieve universal usability. Research would help to alleviate these dangers as well as improve usability, engage a broad segment of residents, provide management tools for civic and local leaders, protect individual privacy and security, and raise reliability even in challenging situations.

At every point in developing TMSP for national priorities, there are deep science questions with profound theoretical impacts on human use of technologies. Computer science challenges include scalable network analysis algorithms, effective visualizations that guide moderator decisions and community organizer activities, and universal usability to support diverse users and platforms. Then data-driven visual analytics would enable tracking and ranking evolving networks, agent-based simulations, and searching for distinctive or common features in large networks.

There are strong research opportunities for topics including collective intelligence, collective action, social creativity, social dilemmas, and basic ideas such as privacy, freedom, and identity that influence design decisions and social participation. Extensive research is needed to identify social roles, building on recent work to find "answer people," "discussion people," "reply magnets," potential vandals, and so on. Basic research is needed to develop useful metrics for issues such as community efficacy, conversion rates from readers to contributors, intensity of engagement, degree of reciprocity, network density, and local/global connectedness. A key notion is to expand on motivation for different participants and show how managers can influence outcomes with usability and sociability interventions, while addressing security versus freedom trade-offs.

NATIONAL INITIATIVE FOR SOCIAL PARTICIPATION

The collection of articles published in this special issue emerged from the grassroots efforts of participants from academia, private industry, and government who have come together to propose a National Initiative for Social Participation.

An initial meeting held at the University of Maryland in spring 2009 solidified the formation of a core group and the presentation of a report[8] that subsequently led to National Science Foundation support for workshops hosted by the Palo Alto Research Center in December 2009 and the University of Maryland in April 2010 (www.tmsp.umd.edu). The aim of these workshops was to produce a roadmap for national research and development, education, and policy. The reports of this group have been tailored into the articles in this issue focusing on theory, design, infrastructure, health, education, government, and other domains.

Because of the complexity of the technology and the related phenomena, the reports collectively argue for national-scale funding of a collaboratory of distributed multidisciplinary centers. Just as NASA leads space research and the National Institutes of Health promote medical research, we anticipate that a National Initiative for Social Participation would invigorate online social media research. We believe that TMSP deserves much greater attention from policymakers, research funders, corporate leaders, academics, and students. C

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