A Grand Challenge: Shaping the Government of the Information Age

A White Paper in response to NSF 10-069 ("Dear Colleague Letter for SBE 2020: Future Research in the Social, Behavioral, and Economic Sciences")

By **Hans J Scholl** (President, University of Washington), **Eduard Hovy** (Former President, University of Southern California), **Andrea Kavanaugh** (Secretary, Virginia Tech), **Theresa Pardo** (Board Member, University at Albany), **Christine Williams** (Board Member, Bentley University), and **Jay Kesan** (Society Member, University of Illinois at Urbana-Champaign)

Representing the **Digital Government Society of North America**, an association of scholars and practitioners from multiple disciplines engaged in research on and practice in transforming government.

Abstract

Government in the Information Age must act and react swiftly to the complex problems faced by society. In the Information Age, governments are also under greater scrutiny. In response, government must be more flexible, agile, informed, transparent, and inclusive than ever before. Yet, despite recent advances in modernizing government practices, today's governments have not taken full advantage of many opportunities made possible by information technology, and are not ready to meet the challenges of the Information Age. Shaping government to be flexible, dynamic, and technologically innovative is a grand challenge that involves the collaboration and joint effort of multiple academic and practice disciplines. The gaps in what we know about government itself as an institution and how information and technology interact with the institutions of government are great. To fill these gaps we propose a ten-year/$250m program to develop the academic domain, its capacity, critical mass, and infrastructure. Centers of Excellence in Teaching and Research (COEs) are needed to create, disseminate and employ smart information, leverage social media to engage citizens, and help transform the practice of government.

The Fundamental Question

Governments must have the capability to respond to the swiftly changing requirements of an increasingly complex, globally connected, and mobile information society. To create this capability governments must transform. Technology plays a decisive role in this transformation process. The fundamental question of interest is, "How can information and advanced information technologies help transform government?"

A funding program focused on research specific to the public sector context would help create the new knowledge governments and their partners need to respond to these demands. Three theses are presented below to draw specific attention to the unique role of government in society, to the potential of technology to help transform that role, and to the questions that must be asked to frame and inform those efforts.

Thesis 1: Real transformation of government is possible

In recent decades, U.S. governments at all levels have introduced novel information and communication technologies (ICT) with notable success delivering benefits within government, to non-governmental organizations, and to citizens.

However, while filing taxes electronically and renewing driver licenses online are great advances in transacting government business, these services tap only a fraction of the transformative potential of technology in government. Beyond these service areas, governments are also increasingly pursuing participation agendas. To deliver on the transformative potential of technology in both service and citizen engagement, government must create a whole broad range of new technology-enabled government processes and services.

To realize this transformation, more research is needed to understand the role of technology in creating a dynamic, agile, and citizen-centric government. We need answers to questions such as: What is the transformative potential created when technology becomes a tool for government programs and services, and what are the limitations of pervasive and mobile ICT in government? What is the nature of interaction among various actors in the new environment of government? Which new capacities do ICT provide in this context? Which technology combinations are most effective under which circumstances? How can decision-making processes be accelerated while maintaining appropriate levels of participation and privacy, transparency and accountability?

Why is this important?

Human actors in modern information societies live at a much faster pace with greater mobility and flexibility. Information societies never sleep. Information is exchanged globally and acted upon locally within minutes and seconds rather than weeks or days. Societal problems such as those created by the recent financial meltdown or large-scale natural or manmade disasters have shown that traditional administrative, legislative and judicial processes are too slow and only partially effective in providing the response

capability necessary in this information age.

Government in the information age must have the capacity to respond quickly and effectively to unforeseen and fast-changing circumstances. This requires new knowledge about (a) smart information management, that is, the instantaneous acquisition, selection, integration, and assessment of information relevant to a particular situation, (b) flexible processes for negotiating, planning, and coordinating actions of diverse yet connected stakeholders, (c) collaborative engagement of governmental and non-governmental agencies and resources as well as citizens.

While advanced ICT enable highly agile, mobile, and flexible modes of organizing, the nature of interaction of diverse actors in this context and the respective roles and requirements of ICT and smart information are not clear and require systematic and rigorous examination. New research is necessary to fully understand the nature of the rapid and real-time interaction of organizational and individual actors in such fluid environments.

Research designed to answer these questions must be framed in the interactions between technology and the unique context of government, at all levels and across policy domains. New research programs focusing on these questions must support new kinds of multi-disciplinary research partnerships; with incentives for new researchers from political science, public administration, computer science, information systems research, information science, communication sciences, business administration, law, economics, and sociology to come together in innovative partnership models.

Thesis II: The value of information is accepted but not well understood

Transparency is a prerequisite of both accountability of government and trust in the fair balance of government action. In that vein, in 2009 the U.S. federal government began making massive amounts of data available to the public. Following this lead, state and local governments are now also making more datasets available. While these moves are seen as contributing to the end of longstanding practices of information withholding, the sheer amount of data currently available to the public is overwhelming. The presumption was that once the data were made available, a market of tools would emerge making wide use of the data possible. While this has happened to an extent, the critical role of and potential uses of data in terms of improved decision making is unclear. Smart decision-making hinges upon the availability of 'smart information.' Smart information allows for rapid decision-making followed by immediate action. Information can be characterized as smart when it regularly passes ex-post scrutiny of key stakeholders despite its rapid compilation and incomplete sourcing under volatile circumstances.

Key research questions include: How can decision makers effectively use the overwhelming wealth of data available to government and the public? What are the characteristics of smart information relative to purpose and context? What tools are most effective in filtering, selecting, analyzing, and compiling data relative to purpose and context? How can smart information be disseminated most effectively to stakeholders? How trustworthy is smart information? We need research that helps understand the

characteristics of smart information regarding identification, compilation, dissemination, evaluation, and utilization in government and beyond.

Why is this important?

The effectiveness of both ad-hoc and routine data exploration and analysis needs to be assessed. This encompasses the development of appropriate and sophisticated tools for use by both experts and non-experts, as well as the training of government workers, non-government organizations, and citizens in using these tools. Therefore, seeding developments via targeted research and development projects is required to quickly build capacity in this regard, which must be seen as a foremost task of government. New research, for example, is necessary to understand the role of free market approaches to the development of data tools offers versus government-based efforts. How do these different approaches work technically, but more importantly how might these different approaches be used in the policy influencing process.

Multiple disciplines would be involved in such an endeavor: Political science, public administration, business administration, computer science, information systems research, information science, communication science, law, economics, and sociology.

Thesis III: New knowledge about social media and its potential to change the citizen experience and the practice of government is needed

The current U.S. federal government has been using social media tools such as Facebook, Twitter, and YouTube to mobilize citizens and increase engagement in the practice of government. New kinds of interaction between government and citizens have potential for increasing citizen engagement and direct feedback on government action. Via social media, citizens share information with each other, as well as participate, and directly contribute to government programs and action. However, research is necessary into how these novel channels of communication, knowledge sharing, and interaction behaviors can be leveraged within government.

While increased citizen involvement appears desirable, the implications for the practice of government are not clear. Will participating citizens unduly influence government programs and decisions at the expense of non-participating citizens? How will the increased use of social media impact decision-making in a representational model of democracy? How can government make sense of the massive amount of information created through the use of social media in government? How can and should smart information be obtained and shared? How much does the use of social media improve or degrade the quality of decisions and the decision-making process? How can government agencies avoid exacerbating problematic situations by injudicious use of social media? How can citizens make sense of the engagement and feedback given by government agencies and other citizens? How will the use of social media change the relationship among citizens and between government and citizens?

Why is this important?

In the turbulent and fluid environments described above, government and citizens do

not solely rely on the traditional and slow feedback channels such as elections, polls, and surveys. Governments need more immediate feedback to stay in tune with citizens' wants and expectations. At the same time, citizens expect government to become more sensitive to changing needs or views in society at large. Citizens no longer accord elected officials carte blanche. Social media offer a fast and public feedback mechanism on officials' actions. The potential and limitations of these media need to be better understood.

Research needs to uncover the efficacy, limitations, and potential pitfalls of social media use in a government context. Building better understanding of social media use in the context of democratic processes is likely to prove critical to the relationship between government and citizens in the Information Society. Multiple disciplines can contribute to the necessary knowledge building including law, political science, public administration, computer science, information systems, industrial and systems engineering, information science, communication studies, and sociology.

Shaping information-age government is a highly complex socio-technical challenge, indeed a grand challenge, which cannot be mastered by a single traditional discipline. Rather, multiple disciplines as well as emerging strands such as the sociology of cyberspace, information assurance research, and cyber-security studies need to collaborate to create a roadmap of the potential and well-understood pathways toward more effective, agile, and open government.

Advancing the domain

We propose a ten-year funding program dedicated to "Shaping the Government of the Information Age" with a volume of $250m (two hundred fifty million), which exclusively funds multi- and interdisciplinary research teams. This research program would focus on understanding the rich socio-technical context of government in the information age. It would aim particularly at creating tools and procedures for research and practice but also research exemplars that showcase effective multi- and interdisciplinary collaboration. As an envisioned outcome of the "Shaping the Government of the Information Age" program we would expect to better understand the grand challenge of government transformation in the information age and how to build effective multi- and interdisciplinary research designs capable of connecting diverse natural, technical, and social sciences.

Building capacity

For decades the public sector has been plagued by a scarcity of expert labor in modern ICT. Meeting the grand challenge of "Shaping the Government of the Information Age," requires new kinds of professional expertise both inside and outside government. Integrative, that is, truly multi- and interdisciplinary undergraduate and graduate curricula, must be developed to train future experts to:

- Understand the concept of a democratic information-age government

- Compile, analyze, and effectively use smart information

- Design, implement, and use highly flexible and mobile ICT in the context of information-age government

- Understand the uses and limitations of social media in the context of information-age government

Such curricula should be jointly developed by Public Administration, political science, and information schools with other schools and departments as contributors. Some public administration and information schools are already offering dual degree programs at the master's level (for example, Syracuse U, U of Washington). Such programs should be expanded to other disciplines and the extended curriculum as outlined above.

Building Infrastructure

As a complement, COEs in research and teaching should be formed with multiple disciplines as contributors. Nationwide at least four to five COEs should be chartered and funded for a period of at least a decade.

The COEs, of the "Shaping the Government of the Information Age" initiative would generate the critical mass needed to impact the overall scientific and administrative landscape. While fully interdisciplinary and broad in overall scope, the centers could take the lead in major areas such as "smart information in government," or "social media implications," or "understanding diverse contexts when implementing novel ICT in government," or "integrative interdisciplinary research in the context of government."

References

In the past decade the body of literature dedicated to ICT-enabled transformative government has grown to some 4,000 peer-reviewed research articles and monographs, for which references can be found under http://www.dgsociety.org/library.php#endnotes.

Please also see http://www.dgsociety.org