

Introduction to the Special Issue on Policy Informatics

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In 2007, the Center for Policy Informatics was established at Arizona State University (ASU), aiming to build a community of researchers who are interested in exploring the influence of advanced information technology for computation and communication on public policy. At the onset, the center did not have a clear conceptual boundary for what policy informatics is. Instead, our efforts were directed to identifying innovative research based on an informatics perspective that was emerging across the country and that resonated with our own research. In February 2010, after two years of explorations and interactions, a workshop exploring policy informatics was held at ASU's Decision Theater, an immersive visualization facility that embodies this new potential. The workshop included over twenty-five participants from ten major US universities. We noticed that although thirty different fields were being represented, the participants identified themselves with the problems at hand rather than with their disciplines. For instance, the familiar, "As an economist..." was replaced with "As someone who also studies water policy...". This special issue presents the work of many of the participants in that workshop in addition to that of other scholars who engage in research organized around public policy problems from an interdisciplinary perspective.

In our call for papers, we stated, "the intent of the issue is to introduce scientific and methodological advances to tackle challenging social problems in various policy areas." We learned two things from the process of developing this special issue. First, a long and challenging path is still ahead of the synergistic integration of policy sciences (Lasswell, 1951), systems sciences (Weiner, 1948); von Bertalanffy, 1968) and many other information scientists. Second, scholars in this special issue have demonstrated the potential of the innovative integration of systems thinking with policy and they present new hope in developing policy research aided by advanced information, computation, and communication technologies.

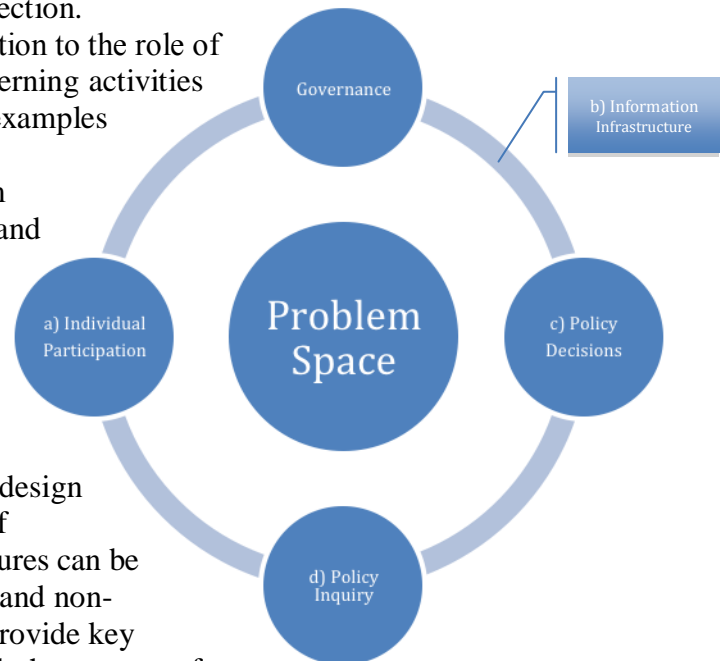
The state-citizen relationship and policy decision-making have been core research subjects within the field of public administration, management and policy (generally referred to as public affairs these days). What has become explicit in the field is a shifting of scholarly interests from organizations to organizing for social problems, from government as a single primary entity to governance that involves active constituents and non-governmental entities, and from variance theory-based research to process-oriented research. Contributors to this special issue have recognized that these extensions can be better conceptualized, examined and understood by exploiting advances in information and communication technology. Taken alone, each manuscript is a current example of the emerging generation of research facilitated by changes in informatics. Comparing sets of readings shows that each set contributes a complementary piece to a policy informatics framework.

a) One set of papers focuses on the changing role of individuals in a connected society. Dawoody's manuscript tracks the parallels between technology and political movements over time to demonstrate that advances in information technology enabled a shift from passive citizens to global participant-observers with new pathways for organizing and contributing. The

work by Lampe et al. provides a practical balance to the potential of Dawoody's piece by exploring the difficulty of realizing citizen engagement's full potential through a case study across Michigan. They explore the use of a social media that tried to "crowdsource" feedback about local policies and agencies and report the factors that hindered the success of the project. How to increase the chances for success on future attempts are discussed based on the lessons learned. These papers urge us to rethink what should be considered in the debate on citizen engagement via information and communication technologies and how to redesign information infrastructures for governance.

b) A second set of papers explores the change of information infrastructures that supports governing activities, but from the opposite direction.

Wauchhaus's manuscript explicitly calls attention to the role of information management as an enabler of governing activities and citizen participation. He argues, through examples and a rich literature review of new trends in governance, for the development of a platform orientation to public governance. Koliba, Zia and Lee's paper approaches the same topic by laying out key concepts, identifying functions and relationships of inter-organizational governance networks as a precondition of information flow management. They argue that in this manner governance informatics can help assess and redesign the accountability and transparency regimes of governance. Changing information infrastructures can be a response to the changing role of individuals and non-government organizations, but they can also provide key ingredients in support of policy-making, which the next set of papers aims to achieve.



c) A third set of papers exemplifies how the advancement of information and computational technologies enhances policy analysis. Barrett et al. uniquely contributes to the area by presenting an advanced information integration framework for real time policy decision-making. Their research framework, decades in development, creates synthetic populations that interact in a sophisticated simulation-based approach to policy analysis. By creating a mosaic of responsive adaptive systems, their team explores how a variety of interventions, including policy options, play out across the interconnected systems to create intended and unintended consequences. Desouza and Lin further argue why a computational modeling approach adds real value in supporting what they call evidence-driven policy-analysis. They highlight the opportunities of simulation to explore multiple future-oriented scenarios to manage challenges of understanding complex adaptive systems in uncertain environments. Both papers also highlight the power of simulations to translate research findings from discovery to practice.

d) A final set of papers presents applied research enabled by the developments mentioned above, but from a perspective of policy inquiry. Learmonth et al.'s UVa Bay Game is a large-scale agent-based simulation of the Chesapeake Bay watershed that allows players to take the

roles of stakeholders, such as farmers, local policy-makers, watermen, and developers who make decisions about their livelihoods. Upwards of hundreds of simultaneous participants, each in separate roles and localities are able to track how their decisions, at an intimate scale, aggregate to influence the conditions on the watershed and each other at different stages over a twenty-year period. In contrast to Learmonth et al., Heidelberg and Eckerd built a personal, prototype agent-based model to conduct computational experiments as an observer of the system. They explored how home-ownership policy to improve community quality is paradoxically widening the quality gap between high quality and low quality areas. These papers highlight that different modes of inquiry are available to policy scholars and practitioners.

While it has been insightful to see these scholarly endeavors exploring different dimensions and possibilities of policy informatics, this issue does not capture all of the research approaches in the area. For one example, the work of Derek Hansen analyzes social media networks to gain insights from a connected world (Hansen et al., 2010). As an emerging field, we have not yet developed a coherent language that naturally connects these efforts. However, we believe that these manuscripts, taken together, are sufficient to identify a community of practice and to start to ask a set of interesting research questions that can inform theory-building, theory-testing, and praxis.

About the editors:

Erik W. Johnston, Ph.D. is an Assistant Professor in the School of Public Affairs at Arizona State University and the Co-Director of the Center for Policy Informatics. He is currently engaged in four lines of research: 1) assessing how models and simulations can aid in policy decisions, 2) understanding the policy consequences of implementing and sustaining collaboration in civic, business, and academic contexts, 3) designing and analyzing smart governance infrastructures in distributed organizations, teams, and communities, and 4) applying complex systems methodology and theory using agent-based modeling as a complement to quantitative and qualitative research methods. Dr. Johnston earned a PhD in Information and a Certificate in Complex Systems from the University of Michigan. He is a two-time National Science Foundation IGERT (Integrative Graduate Education and Research Traineeship) fellow, in the STIET (Socio-Technical Infrastructure for Electronic Transactions) and IDEAS (Institutions, Diversity, Emergence, Adaptation, and Structures) programs. He can be reached at erik.johnston@asu.edu

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