

Preface

by Brian Kahin and Steven J. Jackson

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“Cyberinfrastructure” was originally shorthand for Internet-based information infrastructure, one of the “critical infrastructures” that merited special attention as a matter of national security [1]. The National Science Foundation has since adopted it as a programmatic label for advanced knowledge infrastructure, which despite its roots in NSF’s core competencies (science, engineering, education) is essentially unbounded. It offers a promise of informing and enabling innovation wherever it may occur — and in doing so, helping us better understand the processes, practices, and institutions of innovation. Since we look to innovation as a principal source of increased productivity and economic growth, NSF’s initiative on cyberinfrastructure may prove as politically and strategically important as the development of the Internet, in which NSF also had a central programmatic role.


The objective of this project was not to examine NSF’s program on cyberinfrastructure, but to look at how cyberinfrastructure as an evolving enabling vision (rather than a given that merits protection) faces the innovation landscape beyond NSF’s academic constituency. It’s not just a matter of the social and economic impact of cyberinfrastructure, or the constraints that markets, laws, and policies impose on cyberinfrastructure. Rather it is a matter of designing an optimal ecology for knowledge and innovation, drawing on what can be done with science, software, organizations, and policy. This challenge is both technical and political. It is a challenge of how to get infrastructures — including infrastructure implicit in laws and markets — to work together as well as they work internally. This is a crucial test for both interdisciplinary collaboration and U.S. innovation policy.

It is also the ultimate challenge of “virtual organization” — not as *the* virtual organization in the sense of a like-minded knowledge-centered community but as a process for harnessing distributed heterogeneous resources (including expert individuals and institutions) in pursuit of common goals and objectives.

The papers in this special issue of *First Monday* were originally presented at a conference held at the National Academies on 29–30 January 2007, co-sponsored by the National Science Foundation, University of Michigan, Council on Competitiveness, Committee for Economic Development, and Science Commons [2]. We would especially like to thank John Wilbanks and Kaitlin Thaney of Science Commons for their help on the program and logistics. We would also like to thank Bill Wulf, President of the National Academy of Engineering, for hosting the event, and to his staff for their help.

This is the fourth project in a series that began with *Understanding the Digital Economy* [3], followed by *Transforming Enterprise* [4] and *Advancing Knowledge and the Knowledge Economy* [5]. These projects have provided the international policy community with insight from prominent researchers on critical aspects of the digital economy. In contrast to the others in the series, *Designing Cyberinfrastructure for Collaboration and Innovation*, focuses on an evolving vision of what information technology can do — and the challenges of sustainability, openness, integration, and control that it presents. Because of this closer focus, we are publishing the papers of the conference as a special issue of *First Monday* in order to reach a broad audience quickly and in a readily citable and accessible form. We thank Ed Valauskas for making this possible.

We especially wish to thank Suzi Iacono, who in various capacities at NSF has helped wrestle through a long-evolving methodology for these projects. We also wish to thank our many colleagues at NSF in CISE, SBE, and the new Office of Cyberinfrastructure who contributed to thinking through the conceptual framework and particulars of the program.

We would like to think that this project reaffirms the role of collaboration and innovation in our methodology. There have been many partners for this series over the years, and collectively they have helped bring in a wide range of contributions to understanding the disruptive and transformative significance of information technology. No less importantly, they have also helped us with the unending challenge of how to inform public policy with research, and conversely, how to inform academic research with an appreciation of public policy, in a world made increasingly complex by technology and globalization. 

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## Notes

1. See <http://www.whitehouse.gov/pcipb/>. *Wikipedia* traces the first use of the term to a 1998 press briefing in the "critical infrastructure" context (<http://en.wikipedia.org/wiki/Cyberinfrastructure>).
2. Principal funding for this project was provided by funding from the National Science Foundation under grant number 0551766. The views expressed in these papers are, of course, those of the authors, and not necessarily the views of NSF or any of the other sponsors.
3. Erik Brynjolfsson and Brian Kahin (editors), *Understanding the Digital Economy*. Cambridge, Mass.: MIT Press, 2000; <http://www.technology.gov/digeconomy>.
4. William Dutton, Brian Kahin, Ramon O'Callaghan, and Andrew Wyckoff, (editors), *Transforming Enterprise*. Cambridge, Mass.: MIT Press, 2004; <http://transformingenterprise.com>.
5. Dominique Foray and Brian Kahin, (editors), *Advancing Knowledge and the Knowledge Economy*. Cambridge, Mass.: MIT Press, 2006; <http://advancingknowledge.com>.

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