

# NECESSARY CHARACTERISTICS\*

American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities

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## 1 Necessary Characteristics

An effective and trustworthy cyberinfrastructure for the humanities and social sciences will have the following characteristics:

### 1.1 1. It will be accessible as a public good.

We have argued that digital information has an inherently democratizing power—but that power can be unleashed only if access to the cultural record is as open as possible, in both intellectual and economic terms, to the public. On the one hand, the Web has made a great deal of human knowledge available for free: with its nine million items, the Library of Congress’s American Memory program is but one example. On the other hand, commercial entities have taken an increasingly prominent role both in digitizing public-domain cultural heritage and in digitizing cultural heritage materials still under copyright; these collections are often only available to organizations (such as major research libraries) able to pay substantial subscription or license fees. If public funds are involved in the creation of a digital resource, proportional elements of those resources should be freely available to the public.

### 1.2 2. It will be sustainable.

Sustainability is often thought of as primarily a financial issue: how will a project persist after start-up funding is spent? The digital transformation has raised questions about how to finance research, scholarly communication, and preservation that previously were obscured by the practices of libraries and university presses. Many humanists may have first encountered the concept of sustainability in discussions with potential funders of digital projects. As Diane M. Zorich noted in 2003, we need to avoid treating digital initiatives “as ‘special projects’ rather than as long-term programs.”<sup>1</sup> Although funding is critical to a program’s viability, sustainability goes beyond simply paying the bills: intellectual sustainability requires human capital. Digital projects need to draw on a pool of trained and engaged personnel, and therefore universities need to develop the programs and the opportunities that produce people with this kind of expertise. As Kevin Guthrie, the first director of JSTOR and now president of Ithaka,<sup>2</sup> remarked to the Commission, “individual experience is not scalable.”

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<sup>1</sup>Diane M. Zorich, *A Survey of Digital Cultural Heritage Initiatives and Their Sustainability Concerns* (Washington, DC: Council on Library and Information Resources, 2003) <http://www.clir.org/pubs/reports/pub118/contents.html> (<<http://www.clir.org/pubs/reports/pub118/contents.html>>).

<sup>2</sup><http://www.ithaka.org/> (<<http://www.ithaka.org/>>).

### 1.3 3. It will provide interoperability.

Access to data should be seamless across repositories. This will require standards-based tools and metadata that ensure interoperability and enable use for a variety of purposes. Cyberinfrastructure must be designed to be open, modular, and easily adaptable to new technologies so that the pursuit of interoperability does not become a source of delay and constraint. It must also be built to foster and support knowledge communities, which themselves must include information professionals who understand the standards issues. As NSF director Ardent L. Bement, Jr., observes, “with today’s electrical grid. . . my neighbor and I can use different appliances to meet our individual needs; as long as the appliances conform to certain electrical standards, they will work reliably,” and a sufficiently advanced cyberinfrastructure will work similarly: researchers will have “easy access to the computing, communication, and information resources they need, while pursuing different avenues of interest using different tools.”<sup>3</sup> In sum, cyberinfrastructure must serve geneticists and genealogists, historians of Buddhism and collectors of Delta blues, filmmakers and dancers, those in the academy, those working in business and industry, and those home-schooling their children.

### 1.4 4. It will facilitate collaboration.

Digital technology favors openness and collaboration. Defining and building cyberinfrastructure should be a collaborative undertaking involving the humanities and social sciences communities in the broadest sense. It is equally important that the cyberinfrastructure be designed to foster and support collaboration across disciplinary and geographical boundaries and to bring new perspectives to bear on the exploration of the cultural record. Collaboration will be especially important as institutions of higher education seek to preserve and archive digital materials. Digital preservation will require leveraging talent, resources, and commitment in the academy, in the commercial sector, and in government. Each sector has already made significant contributions, each has a leadership role to play, and each needs to be further involved in the curation of our cultural heritage.

### 1.5 5. It will support experimentation.

Although cyberinfrastructure itself should be stable and reliable, it will need to support ongoing experimentation, and it will need to evolve. Researchers in the social sciences and humanities will need to experiment, and that experimentation will be crucial to bringing change to those disciplines. Institutions must encourage risk-taking by creating frameworks through which junior scholars and students are rewarded for ambitious research programs. Offering this encouragement means providing laboratories, postdoctoral grants, and other support that allows these research programs to be worked out and critically assessed. Institutions also need to allow their libraries and university presses to experiment and take chances in order to find more successful models of scholarly communication. It is important to foster a culture of experimentation by underwriting explicit mechanisms and traditions for capturing and sharing the lessons learned through innovation. True experimentation always carries with it the possibility of failure, as the necessary price for success, yet informative failures are essential to moving forward into the unknown, and they should be reported without prejudice and duly valued on that account.<sup>4</sup>

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<sup>3</sup>Ardent L. Bement, Jr., “From Concept to Confluence: Framing Our Cyberinfrastructure,” remarks, SBE/CISE Cyberinfrastructure Workshop (16 March 2005).

<sup>4</sup>John Unsworth, “The Importance of Failure,” *The Journal of Electronic Publishing* 3.2 (December 1997) <http://www.press.umich.edu/jep/03-02/unsworth.html> (<<http://www.press.umich.edu/jep/03-02/unsworth.html>>).