San Diego Supercomputer Center Director Urges Academia to Make Cyberinfrastructure “Real”

SDSC’s Berman Says Cyberinfrastructure Essential to Advancing Research and Education in the Information Age

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Comprising the "infrastructure" for the Information Age, cyberinfrastructure - the organized aggregate of information technologies, organizations, and human resources - is essential for future research advancement and discovery. In this month's *EDUCAUSE Review*, Dr. Fran Berman, director of the San Diego Supercomputer Center (SDSC) at the University of California, San Diego, makes the case for investment in cyberinfrastructure as part of the "IT bill" for the Information Age.

Just as technology transformed the Industrial Age, Berman writes that cyberinfrastructure, or CI, has the potential to be a key driver of the Information Age, particularly with the explosive growth in digital data that is creating a new set of challenges in information management, storage, and long-term preservation. "Fundamental to modern research, education, work, and life, CI has the potential to overcome the barriers of geography, time, and individual capability to create new paradigms and approaches, to catalyze invention, innovation, and discovery, and to deepen our understanding of the world around us."

The challenge is that in the research and education community, cyberinfrastructure is both a continuous work-in-progress and a stable infrastructure driver for invention and innovation. "The academic community continues to struggle to provision and sustain broad-use community CI within traditional academic frameworks," according to Berman. "Changing this will involve a paradigm shift in the way we think about designing, evolving, provisioning, and learning about CI; new partnerships between academics, the federal government, and the private-sector-focused CI; and new strategies to incorporate CI within academic infrastructure."

While Berman adds that this practice may be "new territory" for faculty researchers, educators, or university and college administrators, forward-looking academic institutions are launching CI-based initiatives, with the goal of advancing their own research capabilities and educational expertise on campus, and gaining a competitive edge at the national/international levels in the private and commercial research sectors.

Such CI initiatives are already underway on the UC San Diego campus, where SDSC is based and is preparing to open a new, 80,000 square-foot addition this fall that will double the size of the facility, adding office space for interdisciplinary research, and expanding the SDSC data center -- one of the largest academic data centers in the world. SDSC is a key component of UCSD's campus-wide CI planning, which includes a 10 Gb/s network connecting research laboratories and units, OptIPortals which support real-time interactive collaboration, and research facilities such as the California Institute of Telecommunications and Information Technology (Calit2).

"Today SDSC and UCSD are creating a pioneering research cyberinfrastructure for the campus community and are working closely with partners in the UC system to create a 21st century system-wide CI," noted Berman. "The innovations and experience that arise from UCSD and UC cyberinfrastructure will benefit science and society as a whole."

In her *EDUCAUSE Review* article, Berman notes that there is potential for Cyberinfrastructure to be a "new kind of educational discipline" that could easily form the basis of curricula, courses offered in universities and colleges in the same way that computational science became a discipline during the 80's and '90s.

"Both research and education initiatives will be critical to ensuring that the academic community can conduct 21st century research and education with 21st century tools and infrastructure," says Berman. "Only then will cyberinfrastructure become a real foundation for research and education and achieve its transformative promise to accelerate the next generation of invention, innovation, and discovery."

For Berman's full *EDUCAUSE Review* article, click here.

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