Advancing the Spatially Enabled Smart Campus

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Academic libraries have always been a breeding ground for new technologies. Some of the first large-scale computer networks were implemented in libraries. Pre-web technologies such as gopher and hytelnet were designed to help navigate information resources such as online book catalogs and government-produced information. The presence of these networks made the library one of the few places where people other than scientists and engineers could access the Internet (interestingly, public libraries continue to provide vital Internet access to those unable to afford smartphones or broadband access at home).

Moreover, before electronic journals and broadband became ubiquitous, the library was perhaps the only place on campus where faculty from radically different disciplines would meet in the course of doing their work. The physicist and the philosopher would otherwise perhaps only meet socially at the gym or the faculty club. The library continues to cut across disciplinary boundaries. At UCSB we assist faculty who are grappling with emerging mandates to preserve their research data, deposit their publications in open-access repositories, and digitize course materials otherwise only available in print. We also cut also across the boundaries between faculty, students, and the community by presenting general interest lectures, workshops, and providing free access to scholarly resources not otherwise available to the public.

Spatial processes are built into many ordinary library business practices. While we promise to borrow books regardless of their location via inter-library loan, space is actually an important part of the process. Distance is a primary factor in choosing which library to request a book from. However, the system we use also balances workloads and lend-to-borrow ratios. If UCSB is borrowing too many books from Stanford and Stanford is experiencing high demand from other libraries, the system we use will automatically re-route requests to more distant libraries. Even the way books are arranged on the shelf is spatial. Because we use subject-based classification schemes, the stacks are a manifestation of Tobler’s Law: books on similar topics are shelved near each other.

Some libraries are now implementing systems that guide users from a record in the catalog to the correct row of shelves in the stacks—essentially marrying the library catalog with a building navigation system. Here at UCSB, we recently disabled a similar home-grown system that we determined was too expensive to continue to maintain. However, our building is complicated to navigate and we are currently moving massive amounts of materials in and out of the building as well as changing the floor plan. We know our users need help getting to the remaining print materials, so we are evaluating both FOSS and commercial products that will not only be more easy to update, but will also get users closer to their target than the previous system.
Another building navigation system under consideration will guide users towards available computer workstations. Even with ubiquitous laptops, there continues to be high demand for desktop computers in the library. Commercial systems have sprung up that show which computers are currently available. In the future, we anticipate showing which areas of the library have available chairs and tables. It is not a stretch of the imagination to suggest deploying sensors that would measure ambient noise levels, offering users a choice between quiet, contemplative spaces and active rooms filled with conversation.

At UCSB there is also a certain level of excitement in the library. We have an all-new management team that is attempting to revive long-dormant collaborations with partners across campus. The Alexandria Digital Library was designed and implemented by computer scientists, geographers, and librarians working together, but the project has been left practically untouched for the past eight years. Recently we have begun to identify pieces of this effort that can be revived using current technologies. The first of these is the ADL Gazetteer, a place-name dictionary that is combined with a feature-type vocabulary (are you looking for the state of Mississippi or the Mississippi River?), spatial hierarchy (the city of Santa Barbara is within the county of Santa Barbara), and temporal change (East Germany was only a place between the years of 1949 and 1990). The gazetteer will be used as the spatial facet in a new, overarching digital library system built on open source software.

We also have a major construction project underway, and are actively seeking input from our user community on how the future library will operate. Will we continue to offer general desktop computers, or do we need to focus on fewer but more specialized workstations? In an era where many (if not most) library materials are available online, what is the best way to provide face-to-face services to people in their departments or their dormitories? If neither the physicist nor the philosopher need to come to the library to access their journals, what services can we offer to continue the tradition of a trans-disciplinary venue?

Today, opportunities for library to contribute to enabling smart campuses are limited only by time and money. Ever conscious of scarce resources, we continuously look for cost-effective technologies that we can implement affordably. At the same time, we realize that it is vital for us to contribute our expertise in information architecture and information seeking behavior to campus-wide efforts. My participation in Advancing the Spatially Enabled Smart Campus will provide an opportunity to discuss these issues with a wide variety of potential partners.