THE LONG NOW FOUNDATION

Press Coverage

Now and Forever

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IMAGINE IF the librarians of ancient Alexandria had preserved the writings of antiquity in a building that could withstand the fires set by invaders. We might know the answer to that imponderable mystery: How did the Egyptians build the pyramids?

A group of high-tech gurus from the Bay Area is trying to ensure that future generations aren't stuck with similar riddles. Consider archaeologists in the year 5000 attempting to decipher the meaning of four giant faces carved into Mount Rushmore. Ancient gods? Demons to scare off enemies?

On a craggy limestone mountain blasted by arctic winds in the eastern Nevada desert, members of the Long Now Foundation plan to house civilization's archives in what they call the 10,000 Year Library, a still-to-be-built structure designed to endure nuclear holocausts, earthquakes, even the next Ice Age. Their challenge: to determine an equally indestructible form on or in which knowledge can be stored.

To help find the answers, Long Now has recruited an expert with unorthodox ideas for transforming libraries into global information delivery networks—and with the kind of for-profit offshoots that make venture capitalists salivate.

The members of Long Now, which include futurists Stewart Brand and Paul Saffo, have pulled into their ranks a librarian for the 21st century—a blend of archivist, CEO, technologist, entrepreneur and futurist. He is Michael Keller, a former Army National Guard tank commander who set out to be an orchestra conductor and ended up chief librarian for Stanford University's information treasure house.

"I'd been hearing about Keller for years," says Brand, president of the foundation, which is also building the 10,000 Year Library's companion—an eight-story-high 10,000 Year Clock. (It will tick once a year, bong once every century and dispatch a cuckoo each millennium.)

"People described Keller as extremely forward-thinking, energetic and entrepreneurial," Brand says. "We want someone who can rise to an extremely ambitious project. And we know that Michael can execute grandiose projects."

On Oct. 12, Keller will officially unveil one such grandiose project. That's when the university is throwing a black-tie-optional campus gala for those who contributed to the $56 million renovation of the main research library, Green West, renamed the Bing Wing. The six-year metamorphosis of the 80-year-old structure, padlocked since the Loma Prieta earthquake, is the centerpiece of Stanford's refurbished and digitized library network.

The Bing Wing is just one facet of Keller's work. In six years, Keller, 54, has overseen the transformation of Stanford's scattered research facilities into a millennial prototype for libraries around the world; pioneered an online publishing service, HighWire Press, for scientific journals; updated Stanford's network so that classrooms, dorms and offices have high-speed Internet connections; added one million books to the stacks; and expanded the university's prestigious archives with such coups as acquiring inventor-philosopher Buckminster Fuller's personal papers.

Keller's most audacious plan still is in the works: This fall he will present university officials with a proposal for several moneymaking ventures that would allow Stanford to profit off its information wealth.

Who wouldn't want this man to be in on a project that records civilization for all time?

New tech in an old setting

On a late afternoon in August, Keller is leading Brand and me up the imposing grand staircase of the 1919 Bing Wing for a sneak preview of the once dreary, outdated research facility's transformation into a stately neo-Romanesque structure with state-of-the art digital guts. He has been involved at every step.

Despite his graying hair, Keller has the youthful enthusiasm of a freshman as he leads us into the soaring rotunda and proudly shows us the room's centerpiece—a round table hand-crafted out of a chunk of dead oak tree he spotted on campus and had air-dried.

''All of the oak tables, even the lamp tables, have laptop outlets,'' Keller boasts as he shows us the light, airy general reading room, flipping up lids cut into the 19th-century-style oak furniture to reveal computer connectors, a stock feature for all 350 seats in the library.

Brand, the legendary '60s-era hippie guru and author of the Whole Earth Catalog, points to a skylight flooding the room with sunshine. ''When I was a student here, that was painted black,'' recalls the trim, gray-haired former biology major who's flashing back to his undergrad days at Stanford in the 1950s, when students relied on slide rules and scribbled notes with pens while studying in this room. The glass ceiling was blacked out after the bombing of Pearl Harbor, leaving the reading room a dark and apparently romantic place. Brand chuckles at the memory. ''It was a great place to pick up girls.''

Keller, however, is very much concerned with the present—and in blending what's useful today with tomorrow's possibilities. He has not repeated the mistake made by other librarians who embraced technology while dismissing books as antiquated. At Stanford President Gerhard Casper's direction, Keller has continued beefing up Stanford's book and archive collections.

''This is a man who loves medieval musical manuscripts with the same zest that he loves the Internet,'' observes Kevin Starr, California's state librarian, who with Keller has organized a series of workshops to educate librarians confronted with the demands of this digital age.

Behind the 80-year-old walls, Keller's team has left room for the future—like antennas for transmitting information to tiny wireless personal computers that one day may dangle off our bodies. ''We hope the library will be adaptable for technology of the future, whatever it may be,'' says Keller, as he leads us past display cases which will house not just rare manuscripts but flat screens displaying video presentations.

Paul Saffo, director of the Institute for the Future and a founding Long Now board member, sums up why he urged Long Now to name Keller to its board last July: ''Who better to have on the board of the organization that wants to build a library that will last 10,000 years than the person who's rethinking the notion of the library from ground up.''

Long Now was founded in 1996. Brand, Danny Hillis, designer of supercomputers, and the other Long Now members hope the clock and library projects will inspire people to take the long view of civilization, instead of gauging progress against the technological addiction to ''faster/cheaper.''

As a rite of initiation, Brand has brought Keller a gleaming silver orb which now sits on a table in Keller's office. ''Just try and lift it,'' he urges, then laughs as I'm unable to budge the sphere. ''That's the pendulum bob for the [prototype] millennium clock,'' says Keller, referring to the weight attached to the base of the pendulum. According to the clock's information packet, the bob, made out of virtually indestructible tungsten, ''should last 10,000 years and then some, barring a direct hit by a thermonuclear weapon.''

Professional colleagues describe Keller as a ''pragmatic visionary'' who will fit in with Long Now's futuristic thinkers. ''He's a perfect pick,'' says Karin Wittenborg, head librarian for the University of Virginia, a fellow digital information pioneer. ''He's a risk-taker. It's the kind of visionary challenge that would appeal to him.''

The information businessman

Let's just say that Keller was not universally greeted with a warm California hug when he arrived in 1993 from Yale, where he'd been the associate librarian and director of collection development, and gave Stanford's library staff a not-so-subtle shove into the Internet Age. Some of his aides feared for their jobs as he outlined his vision for ''the ubiquitous library'' that would allow professors and students to ''latch onto text or information about text'' from anywhere via online computing.

He admits there were rough times. ''In 1993, I had a showdown with my staff. I wanted to change the whole process to cost less and deliver more. They became defensive, and I fired them,'' says Keller, whose brusque style is more like a hard-charging CEO than genteel librarian.

His unconventional plans included putting the card catalog in storage and replacing it with an online version; opening special collections to not just scholars but also undergrads. To leverage the university's information troves, his staff constructed a cybernetwork with millions of links, including the acquisition of tens of thousands of digitized titles.

Out of his full-time staff of 400, Keller estimates that he dismissed about 20 senior managers, replacing them with hand-picked lieutenants. ''They weren't prepared to do what I was telling them to do,'' he states matter-of-factly. In a subsequent e-mail, Keller expressed concern that this might sound ''imperious and uncaring'' and stressed that the dismissals were a mixture of layoffs, a peer review process and employees who were urged to look for new jobs.

''There's a certain amount of concern that Mike's moving fast and independently,'' observes Deanna Marcum, president of a Washington, D.C., think tank, the Council on Library and Information Resources: ''He's not a joiner. He's trying to make things happen and he's not worried about being part of the mainstream.'' In other words, when it comes to innovation and speed among librarians, Keller's like an Uzi firing among six-shooters.

Wittenborg is more blunt about why Keller has riled up some of his professional counterparts. ''Some people find him brash. He only has one speed—top speed. He has an opinion on everything; he has enormous self confidence,'' she says. ''He agrees, as some of us do, that the pace of change is accelerating and we have to move with it.''

Keller delights in flaunting his unorthodox résumé, which is striking for what it doesn't include. He's a musicologist by training who landed in library science management in 1970 when he couldn't find a job as a music professor. He dismisses his master's degree in library science as little more than ''my union card.'' (He doesn't require library science degrees for all his hires—for a curator of American history, he wants strong history credentials.)

Keller has no MBA, although he's essentially CEO of a $42 million operation with $2 billion in assets. And while he's using technology to reinvent libraries, he has no formal computer science training. He boasts, ''I'm self-taught.''

Keller's out-of-the-box thinking has flourished at Stanford, birth mother to the Silicon Valley's entrepreneurial spirit. Shrewdly foreseeing the potential of cross-pollinating information with technology, Stanford's Casper conferred dual titles on Keller when he hired him: university librarian and director of academic information resources, making him the chief technology policy-maker for the high-tech equipment used by students and professors.

Working in conjunction with Stanford's information technology staff, Keller and his aides oversee the selection of computers, software applications, even the cables and routers used to give academics high-speed Internet connections.

Because of his influence, Keller is wined and dined by some of Silicon Valley's largest technology companies in hopes that Stanford will buy their latest gear.

''I flew him over for a digital library conference in Cologne,'' says Art Pasquinelli, who heads the Sun Microsystems unit selling sophisticated computer equipment to the increasingly lucrative library market. ''Digital librarians in academic institutions are doing leading edge stuff with leading edge technology—how to search the Web, document management, payments over the Web, copyright tracking,'' says Pasquinelli, explaining why an endorsement from Stanford can have such weight with Sun's customers. ''They're showing corporations how to do things.''

In July, Pasquinelli invited Keller to lunch at Chantilly II, the chic French hangout in Palo Alto where start-up founders come to celebrate their new millionaire status après a successful initial public stock offering.

Over sauteed calamari, Pasquinelli pitched the library chief on beta testing still-under-wraps Sun technology. Keller responded by pitching Pasquinelli on a $2 million Sun donation to help finance the dramatic floor-to-ceiling media wall that will greet students as they enter the library: He envisions flat screen monitors displaying news from, say, Serbia and Palestine, interactive exhibits, the online card catalog, virtual maps of the library.

''We're even talking holograms,'' Keller said enthusiastically as he sipped his chardonnay. ''We'd need a smoke generator to project CDs into the smoke but hey, how much does a smoke generator cost?'' He paused briefly, then hit his close. ''Think of this: 'The Sun Information Center,' '' he said with a sweep of his hand as if sketching the huge Sun name that would be emblazoned into the wall.

Pasquinelli promised to look into the matter, then hit his close: ''We'll give you some network computers and you can take that big IBM machine out.''

Keller nodded and promised to think about it.

''Conan the librarian''

One day, the university that has helped spawn thousands of start-ups may launch a few IPOs itself if it adopts the business plan drawn up by Keller's team of librarian/marketers.

To understand how Keller the entrepreneur operates, you need to hear the coffee bar story. In the early days of his digital

revolution, members of Keller's staff weren't the only ones irked by the library chief's vision. Some less tech-savvy professors worried that they'd have trouble navigating the online catalog. Others fumed that Keller was pushing through changes without getting approval from individual departments, even though the faculty senate had endorsed his plan.

In the history department, there were grumblings about plans to restructure the reference department, and that when the card catalog was digitized, the older historical information went online last.

''There were some colleagues whose noses were a bit out of joint,'' says history professor David Kennedy. ''Academic culture doesn't always appreciate his executive style, but they got used to it.''

Actually, they came around when Keller turned on the kind of charm used by politicians to win elections. He promised professors that the library staff would help them find what they needed. And he assured the history department that it still had a dedicated research room in the renovated library. And finally, Keller promised the history buffs caffeine.

''What the history guys said they really needed was a place to get coffee,'' recalls Keller, who's banned food and beverages from his new facility. ''So I said, 'Let me build you a replica of my favorite Italian cafe, Robiglio, in Florence.' '' He's recounting the tale as we sip iced lattes at an upscale-looking coffee kiosk just a few feet from the library. The cafe opened in April 1998. Profits are funneled back into the library.

''He hates it, but I call him Conan the Librarian,'' says Paul Saffo, Keller's close friend. ''This guy just cuts through the academic crap. But like Conan, he's charming.''

It would take a Conan type to recast risk-averse librarians as start-up founders. When Keller suggested launching a publishing business, HighWire Press, in 1995, he was so persuasive that instead of balking, university officials saw the potential in such an atypical venture. Last summer, when he tried (unsuccessfully) to orchestrate the purchase of Biosis, a Philadelphia indexing and abstracting service, for HighWire, his Stanford bosses once again gave him a green light.

''Mike realizes that information science also is a mode of publishing, not just a business of restoring and retrieving information,'' observes California librarian Starr.

HighWire was started at the urging of Robert Simoni, a Stanford biology professor and deputy editor of the Journal of Biological Chemistry. Like so many other scientific journals, weekly issues were running up to 600 pages, making the cost of mailing them prohibitive. And libraries were running out of shelf space for such mammoth publications. Simoni approached Keller about publishing the journal online. With colleague John Sack, Keller invented a new cyber-publishing model.

Four years later, the non-profit venture distributes 142 titles, including the journal Science and the online version of the Oxford English Dictionary. It produces $7.5 million in revenue with about $500,000 left after expenses, money that's reinvested in the enterprise. ''It's revolutionized scholarly publishing,'' says Simoni of the venture's success.

In addition to driving down costs, scientific papers now are instantly disseminated around the world. By joining with scientific societies and publishers, HighWire has created a huge Web site (http://highwire.stanford.edu) providing not just journals but powerful tools to search articles and links to supporting data like charts, audio clips and videotape.

HighWire's publisher has more ventures in the works. Marketing surveys conducted by his team show support for several for-profit information services that he's calling Knowledge Enterprises: a HighWire spinoff for trade and professional journals; selling digital copies of material in the Stanford collections via the Internet to alumni and corporations. Companies could even arrange to use Stanford's libraries as their own. ''I'd have to hire a separate staff,'' he stresses, adding that all profits would be plowed back into library and information technology. ''I'm trying to leverage resources to serve more readers and acquire more resources for Stanford.''

Could there be the ultimate Silicon Valley payoff—an IPO—in Keller's future if some of these enterprises become quasi-independent businesses? ''Yes, if I'm on the board,'' he says, noting that his employees also would get equity stakes. ''I'm trying to involve key library figures in business development, so there would be appropriate remuneration for their contributions.''

The future over foie gras

''We'll have the grilled mission figs with jicama, salmon and tuna tartare, steamed clams and mussels with green peppercorn nage.''

We're at Spago, the see-and-be-seen Palo Alto spot for the Valley's in-crowd, and Keller is authoritatively ordering appetizers from the très hip menu. I'd suggested that following our library tour, he cook up his favorite dish so Brand and I could sample his renowned culinary skills as they batted around ideas for the 10,000 Year Library project. But his campus home, an Eichler where he lives with his wife, Carol, and two daughters, 12 and 18, is in the midst of a landscaping project and a mess. So I suggested he pick the restaurant and take charge. I got no argument.

“We’ll eat this Chinese style,’’ he instructs us as the waiter arrives with our first course as well as bottles of an Italian white wine, Tocai Friulano, and a French Rhone red, Vacqueryras, Tardieu-Laurent.

Keller clearly revels in the role of Renaissance Person, as versed in the nuances of preparing a jalapeño martini as in contemplating whether micro-etching text onto minuscule pieces of metal is the best way to preserve humanity’s writings.

Perhaps metal is too tame. Brand throws out a bleeding edge technique he’s read about: Some scientist claims he can preserve a year’s worth of New York Times stories for a millennium in the DNA of cockroaches. Taking a bite of his rack of Colorado lamb, Brand pronounces, ‘‘It’s not just a wild idea. If the New York Times doesn’t have the moxie to do it, we should!’’

Keller grimaces, ‘‘Bugs and libraries don’t mix.’’ But the two men do agree that the digital era has lent new urgency to the project. Not only is the Internet resulting in a chaotic explosion of information, but experts warn that our Information Age could become a blank spot in human history. Unlike stone tablets that have endured millenniums, digital documents written in binary code—the guts of computer language—become indecipherable once currently ubiquitous computer programs like Microsoft Word become obsolete. And that’s every few years, not centuries. ‘‘It’s never been so easy to copy things,’’ observes Brand. ‘‘And it’s never been so hard to preserve things.’’

Both men readily admit they’re still searching for the best medium to save humanity’s record, especially such civilization-changing events as scientific breakthroughs and policy decisions with long-term consequences. ‘‘I’ll confess. I’m not sure how to do it,’’ acknowledges Keller, who rarely admits to being stumped.

The current front runner is the microscopic metal etching technique: Long Now is testing out an attempt to transfer passages from the Old Testament in every conceivable language onto either stable metal or silicon, using not bits but letters. Any civilization that can put a couple of lenses together will be able to read the microscopic text.

‘‘The problem I have with it is that it doesn’t have the same relationship to networks,’’ worries Keller, who’s concerned that this process fails to capture the information-linking power unleashed by the Internet. ‘‘I agree,’’ says Brand, co-founder of the Global Business Network, a consulting group that helps businesses forecast trends. ‘‘If the root text is in analog, then it’s frozen.’’

Although Long Now headquarters are in San Francisco’s Presidio, members usually hold virtual meetings online. The foundation’s Web site is www.longnow.org/ .

Brand is the first to admit that his 10,000 Year Library still is little more than a grand notion. He hopes to flesh out his idea and enlist other information age experts during a conference next June on the Stanford campus. During our library tour, Keller showed Brand the room he’s selected for the gathering, steering us toward one of the windows. ‘‘This looks out on the dish,’’ he explained, pointing to the large white dish that’s analyzing radio signals from outer space in search of extraterrestrial life. Brand’s eyes lit up, ‘‘That’s an even better reason to have the 10,000 Year Library conference here. It’s got the long view.’’

Ironically, it’s the same room where freshman Brand met Aldous Huxley, author of the science fiction classic ‘‘Brave New World.’’

‘‘He blew my mind, changed my life. He’s the reason I became a biology major,’’ he says, recalling the seminar led by the writer who eerily depicted elements of future society. In Huxleyesque fashion, Brand now envisions his 10,000 Year Library as a ‘‘reading temple’’ based on the rugged limestone mountain but with satellite ‘‘branches.’’

Over dinner, he continued sketching his idea. ‘‘We might have canisters on the moon; there could be a time capsule element.’’ Keller nods, commenting, ‘‘The Library is a metaphor. It’s not a single entity but a collection of operations, locations and virtual libraries.’’

Brand queries Keller on such issues as how documents are archived inside such limestone tombs as Iron Mountain in Colorado, where institutions store their precious documents because of the rock’s durability. ‘‘I don’t have a clear notion of how it works. Do you pay a fee? I don’t want to take a lot of time reinventing the wheel.’’

Keller briefs him on the long-term archive system used by universities. ‘‘What got you started?’’ asks Brand. ‘‘The same concerns you have,’’ answers Keller. ‘‘What if California breaks away or is under water?’’

As the two continued brainstorming, it wasn’t tough to imagine the kind of business opportunities taking vague form inside Keller’s head: a CD-ROM with a 10,000-year shelf life; an archive shuttle service to the lunar surface. In the next millennium, this could be the ultimate Stanford IPO.