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From Smart Bombs to Reading Machines

By Rhonda Hillbery

Forget the idea of pushing a new technology to its limits and then trying to find a market for it. One-time rocket scientist Jim Fruchterman '80, MS '80, now turned socially minded entrepreneur, says he wants to use existing technology to help people live their lives a little better. In some cases, a lot better.

Case in point: Bookshare.org, which Fruchterman has set up to provide the largest electronic library of its kind on the Internet. The file-sharing service is modeled on Napster—a concept Fruchterman caught on to early, since he lived two doors down from an early Napster CEO in Palo Alto. But unlike the now-defunct music file-swapping service, Bookshare.org isn't battling a battalion of industry lawyers claiming copyright infringement. Instead, thanks to an exemption in copyright law for people with disabilities, Fruchterman's service is legal, and it is revolutionizing the distribution and delivery of books to the blind and disabled.

The nonprofit Web site has been online since February, operating a virtual bookstore for sight-impaired and learning-disabled readers in the United States. Fruchterman estimates that as many as 3 million people could benefit from the service. Users can access this cyber store through basic PCs, which Fruchterman likes to call "the Swiss army knife for people with disabilities."

Readers pay $25 to sign up, then $50 for annual subscriptions that entitle them to take unlimited advantage of a large library of low-cost scanned books.

After supplying written proof of a disability that affects their reading, and receiving a password, members can select books to download in formats compatible with common Braille or synthetic-voice reading devices.

Fruchterman notes that evolving technology has made specialized formats easier to obtain and to utilize, as digital books can be downloaded over the Internet utilizing digital Braille or digital talking-book standards.

"A Bookshare.org subscribing member would go to the Web site as if it were Amazon.com for the blind, search for the book he or she wants, download it to their PC, decrypt the book with a password, then either listen to it with a synthetic voice or print it out in Braille. Within minutes of choosing a book, users can be reading it using the method of their choice."

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To survey the titles, a screen reader literally reads the names of selections aloud in a "computer" voice.

Through the help of volunteers, Bookshare is able to offer new titles monthly, and its lending library now totals more than 10,000. Choices span a wide range, from The Adventures of Tom Sawyer to A Brief History of Time. Hot categories include recent bestsellers—Stupid White Men by Michael Moore and The Corrections by Jonathan Franzen, to name two—and religious titles.

What helps make the operation low-cost is Bookshare's reliance on volunteers like Carl Hoffmann, who discovered the service while Web-surfing through a Bay Area volunteer database. After being laid off from his job as an online-event producer, the 35-year-old was looking for an appealing way to stay busy. Since January he has worked five to 10 hours a week for Bookshare, evaluating and scanning contributions, keeping track of inventory, and obtaining additional scannable texts by trading titles with secondhand bookstores.

"It's fun because I am accomplishing something," says Hoffmann, who has since found paid work but hopes to continue helping Bookshare. "I am getting through a lot of books that will be read by people who otherwise wouldn't be able to read them."

One blind supporter donated 3,000 books that he had laboriously scanned himself. "He'd been scanning a book a day for 10 years," Fruchterman says.

Upbeat testimonials appear on the service's Web site. One user describes the plight of slowly losing the ability to read large-print books, and credits Bookshare for restoring the freedom to "hunt, search, skim, and read."

Socially minded business models are nothing new to Fruchterman. Back in 1989, while still working in the for-profit world, he founded Bookshare's parent nonprofit, Benetech, an R&D company that develops products "designed to help disadvantaged people achieve equality." Eventually he quit his for-profit job altogether to pursue a hybrid of business and altruism.

In many ways, Fruchterman's quest started at Caltech while he was studying smart-bomb technology in an applied physics course. Warfare technology might seem an unlikely source of inspiration, but he saw the potential for turning it to a new use.

"At Caltech you spend a lot of time wondering how you will come up with a really good idea. I was learning about optical pattern recognition, and one of the applications for it is making a smart bomb.

I was thinking of what, other than military targets, you could recognize with optical pattern recognition. The one idea I came up with was that you could make a reading machine for the blind using the same technology.

"I think that's part of the Caltech culture—how are you going to win your Nobel Prize when you grow up? Of course, that doesn't apply here. It's more of, what's the really important work you're going to do that helps humanity? And the idea of helping the disabled had such a great feeling about it!"

After completing a BS in engineering and an MS in applied physics at the Institute, Fruchterman headed to Stanford's PhD program in electrical engineering. After interrupting his studies to work on a rocket project, which blew up on the launch pad, he went on to launch his own businesses.

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The first one failed. Then in 1982 he cofounded Calera Recognition Systems, a manufacturer that developed and marketed a line of reading machines. After serving in a number of executive positions there, he founded and served as chief financial officer for RAF Technology, which creates mail address-recognition systems used in business and government, as well as the software now used by the U.S. Postal Service.

Along the way, he became frustrated that some of the projects he wanted to do offering the greatest benefit to help people weren't profitable. To address the challenge, he founded Arkenstone, a not-for-profit supplier of reading machines for the visually impaired. When the opportunity came to sell the Arkenstone product line in 2000, proceeds of roughly $5 million went to fund several new ventures, including Bookshare.org.

It's part of the bootstrap strategy of using one business to build another. Fruchterman has other projects under way, including Martus, which will offer technology tools to help human-rights organizations track information. Launch is planned for December. He is also working on a land-mine detection project, as well as on a handheld wireless device that is being codeveloped with Sun Microsystems and is intended to help disabled people navigate through the world of ATM machines, elevators, and other daily complexities.

"We are not giving away technology as charity," Fruchterman says. "We're trying to provide technology that maybe couldn't or wouldn't be provided by the for-profit sector. If we can offer it at a break-even level, it will enable us to launch other projects."

To supplement its revenues, Bookshare also routinely calls on corporations and foundations, including the Open Society Institute and eBay founder Jeff Skoll's foundation, for support. Silicon Valley companies such as IBM, Hewlett-Packard, Intel, and Fujitsu have chipped in with free and discounted computer equipment.

Sharing office space (and a foosball table) in Palo Alto with parent company Benetech, Bookshare.org attracts employees (Benetech has 18 employees and consultants, Bookshare.org has about five) who want to draw a steady paycheck and help people. It doesn't draw techies with visions of quick millions and lucrative stock options, the ones whose get-rich-quick lust was pummeled in the dotcom bust, but the people who work there don't take a vow of poverty either. According to Fruch-terman, Bookshare.org's programmers earn salaries comparable to Silicon Valley norms.

Surveying the wreckage of the local dot.com binge, Fruchterman says that job and lifestyle expectations seem more grounded nowadays. Socially minded projects and proposals were a tougher sell during the boom times. Now he sees more job seekers reaching out for less glamorous but more lasting, less materialistic goals.

"There's a definite change, both in the engineering and business schools, as well as among mid-career professionals. The low point was two to three years ago during the dotcom craze, but the bust and 9/11 have really made people think. They ask, as they consider a new job, can it feed my soul as well as pay the mortgage?"

And if necessary he is more than willing to proselytize. "I feel strongly that I have a missionary role: to sell technologists on how much good technology can do in the world. We fail to give technologists a model between making scads of money on an idea or charity, and I think that technology can do so much for the people who can least afford it, as long as the cost is accessible."

Fruchterman sums up his quest as the search for common ground between what's possible and what's profitable. And as far as he is concerned, that interface is "just about the coolest place anybody could hope to work."