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Borden Mills, a test technician at Kirtas Technologies Inc., places a book in a machine that can automatically scan 1,200 bound pages per hour. The company in Victor has already sold five of the machines, which retail for $150,000 apiece.

Book-scanning uncovered

■ A Victor man has invented a machine to duplicate bound pages.

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There are billions of books sitting on shelves around the world, and Lotfi Belkhir wants a crack at scanning them, page by page.

Belkhir, a one-time Xerox Corp. researcher, has invented a machine he says can do just that, automatically scanning books at a pace of 1,200 bound pages per hour, handling even rare volumes gently.

Accomplish that, he says, and the accumulated knowledge of human kind is suddenly linked to the digital age, accessible anywhere on the planet with Internet access.

"This process is actually gentler on books than the human hand," says Belkhir, chief executive of Kirtas Technologies Inc. of Victor, standing next to one of his machines as it hums away, processing an art book of master paintings.

A technician lays the book onto a special cradle inside the machine and air jets gently fluff up pages on the right side. A robotic arm swings over the book and sucks up one page with a special vacuum, and pulls the page over. Two more robotic arms then swing over and flatten out the pages with clear plastic clamps.

Meanwhile, a high-resolution digital camera snaps away, taking color digital pictures of the pages. A computer automatically crops and cleans up the digital image until the book is done. The result: a DVD with digital images of every page.

Kirtas has already sold five of the machines, which retail for $150,000 apiece, software included.

"We'll be shipping two more machines (this) Friday," Belkhir says. "There are estimates that libraries have 3.2 billion unduplicated titles on their shelves."

Such book-scanning is emerging as a major trend as libraries and others look toward bound books as untapped sources of knowledge and profit.

The Library of Congress has its own book-scanning department that digitally archives rare and fragile books, to preserve the original volumes and still make images of their pages available to researchers.

Kirtas demonstrated its book scanning machine this July at the Library of Congress.

"I think it's an outstanding instrument," said Lynn Brooks, coordinator of the digital scanning center at the Library of Congress. "Understand that this machine is not going to scan large maps or oversize items.

"It is meant to scan bound volumes, do it quickly and lower the per image cost, which is what a lot of people like me are after."

Brooks said the library will "look carefully" at acquiring a Kirtas machine in the future.

Belkhir originally helped design the book-scanning machine for Xerox Corp. Xerox passed on marketing the machine itself, choosing instead to license the technology to Belkhir.

While libraries are looking to book-scanning to make volumes more accessible, others have more commercial goals in mind.

The Internet retailer Amazon.com is now working to scan millions of books to give shoppers a way to search for individual phrases in literature, such as "It was the best of times, it was the worst of times" (Charles Dickens' A Tale of Two Cities) or "Call me Ishmael" (Herman Melville's Moby Dick).

Amazon does not disclose exactly how it scans books, but a spokeswoman for the company, Jani Baker, said Amazon has already scanned 120,000 books and hopes to archive "virtually everything" in the company's catalog.

"This will help people find and discover books in a way they were not able to do before," Baker said.

Kirtas envisions a second, potentially much larger market: corporate libraries.

"Companies increasingly need to get quick access to their documents, for litigation, for intellectual property, to run their businesses," Belkhir said. "Many companies keep those documents in bound volumes that need to be scanned."

Kirtas has some well-known competitors, including Minolta, which now sells a book-scanning machine. Belkhir says his machines are faster and don't require an attendant to turn pages by hand and another to process images.

Eventually, most books and documents will be "born digital," Belkhir said, and won't need to be scanned. Still, there's a lot of scanning to be done on books made before the digital age.

"We're looking at a 500-year backlog of unscanned books since Gutenberg's Bible," Belkhir said. "There's at least another 20 years of work to be done scanning books.

"And that's a good long life for a technology product like ours."