

Diving Into the Details

Fort Wayne Company Creates Health Care Database

By Charlee Beasor

Four years ago, brothers Benjamin and Robin Young took a leap of faith. Back then, the idea of creating one of the largest health care databases in the world wasn't exactly resonating with others in the marketplace. "It was difficult to get people to understand the concept of what we were trying to do," Benjamin remarks.

Even so, the two co-founded PearlDiver Technologies and went ahead with their plans – using Benjamin's ability to "make things go fast" from his experience in supercomputing and Robin's business acumen from his time spent as a top orthopedic analyst on Wall Street.

Today, the company runs a database of more than 1.1 billion fully HIPAA-compliant orthopedic patient records and is preparing to break into other markets – potentially changing the way medical research is collected and analyzed.

"It's an industry that's going to expand. Four years ago, we were the first to really see that. It's starting to come out on the other end of that now; the markets finally understand, and we are perfectly placed right now and coming to much broader public attention," Benjamin explains.

Small company, big impact

Prior to starting PearlDiver Technologies, Benjamin, who serves as president, worked for various companies building supercomputers. Robin, CEO, left Wall Street to start RRY Publications and publish a news magazine, *Orthopedics This Week*.

They chose to locate the PearlDiver headquarters in Fort Wayne, though Benjamin spends most of his time in Colorado, and Robin works primarily in Philadelphia.

Though they had no ties to Fort Wayne, two factors weighed in on their decision to locate there: the city's geographic location as center of the orthopedic industry and recruitment efforts by Rob Young (no relation), then-president of the Fort Wayne–Allen County Economic Development Alliance.

Benjamin also acknowledges the support they receive from Indiana University-Purdue University Fort Wayne (IPFW).

"We use local talent, software engineers out of IPFW and Muncie. We're real pleased with Fort Wayne. Right now, we have 11 employees, so it's still a small business," he says. "It's pretty amazing, I've worked for large companies and never saw this happening this fast. I'm very proud."

'Diving for a pearl of wisdom in an ocean of data'

PearlDiver Technologies uses data mining – the process of extracting patterns from data – to create its databases. It collects sets of data from a variety of sources, including insurance companies and Medicare, and then reconstructs it into the PearlDiver Technologies format for fast and complex data mining.

"We had to develop the technology ourselves, to optimize the hardware and software that does this," Benjamin says.

There are two types of data mining the company uses: a simple data mining that is free and available to the general public on the Internet through the company web site, www.pearldiverinc.com, and a type of mining called "bucket" language.

"Simple data mining is when the user requests information. We developed a much more complex data mining set called 'buckets,'" he describes. "It's the holy grail of medical mining. We wanted to track what happened to patients before and after procedures and do an outcome analysis, which is done through

Software engineer Sergiy Podgorniy works on the PearlDiver Technologies' database at the company headquarters in Fort Wayne (photo courtesy Barry Rochford).



longitudinal patient tracking.”

Benjamin says the idea for the “bucket” language came to them when his brother found a study published about patients who had a deep vein thrombosis (formation of a blood clot) following a knee arthroscopy.

“It followed 54 patients. He came to me and said, ‘We have all this data, we could do this same kind of research, and we could probably find more than just 54 patients to follow,’ ” he recalls. “That was the beginning of our bucket language.”

The language creates a Venn diagram, in which sets of data are overlapped within a set time frame so researchers can easily see the outliers in the search.

In an example search of the same study using the bucket language, Benjamin was able to start with a pool of over 355,000 patients who fit the specific criteria – those who had a knee arthroscopy. After running the search through the PearlDiver software, he was able to see that 5,000 of those patients also developed a deep vein thrombosis.

In quickly scanning the search data, he could tell that a higher percentage of women encountered the condition following their surgeries. He could also point to a specific procedure that resulted in half of all deep vein thrombosis cases.

“This might run for weeks or even months with traditional databases. It ran in about three and a half minutes because of the data organization we’ve developed,” he says. “That’s my specialty, coming out of supercomputers. This is a gold mine for a medical researcher. This is light years faster than doing a medical study.”

PearlDiver Technologies allowed beta testing of the bucket language to students and surgeons at the UCLA School of Medicine, under the direction of Dr. Jeff Wang, professor of orthopedics and neurosurgery at the UCLA Spine Center.

“It’s a valuable tool from the research side to give us an idea of how efficient some of the procedures are,” Wang remarks on the school’s use of PearlDiver technology. “Databases have been around for a long time, but the huge number of patients they have is pretty unique.”

Wang also notes that, aside from surgeons and those in the medical industry, patients could gain useful information from the database on which procedures are the most effective.

Consumer, industry benefit

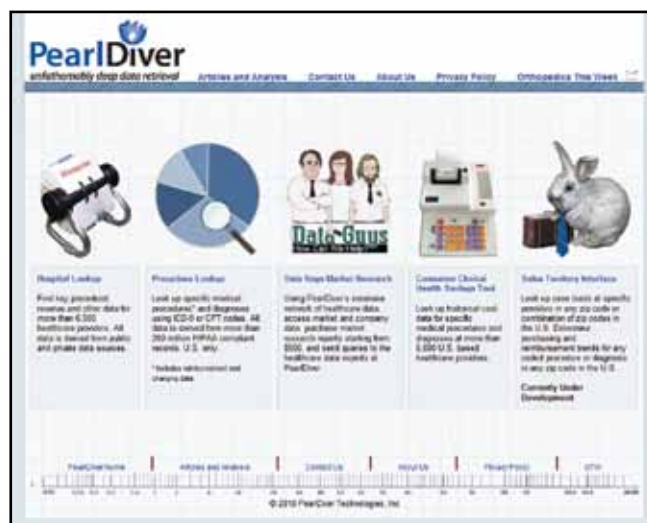
Though the “bucket” language is still in testing, the online features of the PearlDiver Technologies web site are available and free of charge for consumers and those in the orthopedic industry.

On the site, there are four main sections that connect to research or the medical database. Consumers can search the hospital look-up or consumer choice health savings tools, which give information on hospitals, including the price of specific procedures at local hospitals, facilities that are ranked highly and the mortality and readmission rates.

For those in the orthopedic industry, there is a section to research procedures using medical codes. That too, is free to the industry to use. There is also a section for reports and published findings, which is the primary way the company turns a profit.

The next foray for PearlDiver will be taking its research and databases and applying it to a greater swath of the available medical data, diving into more than just the orthopedic industry.

“There is a huge move from the insurance and government side to do outcome analysis to see what’s working and what’s not working. It’s not just being pushed by the government; it’s figuring out what works for what patients and what doesn’t work,” Benjamin says. “There is a real need growing to allow consumers to go in and price medical procedures, and we feel like we’re pretty much on the leading edge of that right now.”



The PearlDiver home page shows the variety of services and searchable databases that are available to patients and medical professionals.

INFORMATION LINK

Resources: Benjamin Young, PearlDiver Technologies, at www.pearldiverinc.com

Dr. Jeff Wang, UCLA Spine Center, at www.uclaspine.com