



INNOVATION ECONOMY

Polaroid's entrepreneurial legacy

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At the new offices of Zink Imaging Inc. in Bedford, the machine shop is full of equipment that once belonged to Polaroid Corp., and the bookshelves of the start-up's library are lined with ex-Polaroid tomes.

In Watertown and Cambridge, clusters of Polaroid alumni work on next-generation display technology at QD Vision Inc. and E Ink Corp. And at Konarka Technologies Inc. in Lowell, about a third of the employees list Polaroid on their resumes, and the company also owns some secondhand Polaroid laboratory gear and coating machinery, purchased "for ten cents on the dollar," says Russell Gaudiana, Konarka's vice president of research and development. Gaudiana spent 27 years at Polaroid.

The Waltham business currently known as Polaroid is a shell of its once-great self, now owned by Petters Group Worldwide of Minnesota. There's no research and development activity to speak of. The company primarily licenses the Polaroid name to electronics makers in Asia, which plaster it on flat-screen TVs, portable DVD players, and digital picture frames. Last month, Polaroid disclosed that it was shutting down plants in Waltham and Norwood that made instant film for professional photographers; 150 jobs vanished with the closures.

Polaroid may endure as a brand, but it has been a while since the company, which pioneered instant photography, has been an engine of innovation in Massachusetts. But former "Polaroidians" are pollinating some promising start-ups - sometimes using intellectual property first developed within the company, or relying on onetime Polaroid equipment.

Zink has the closest connections. As Polaroid was sliding into bankruptcy in 2001, the company was trying to figure out what to do with a printing technology it had developed that doesn't rely on ink, but instead uses a patented type of crystal that changes color in response to heat. Paper coated with Zink's crystals can produce full-color photos when exposed to just the right pulses of heat. The project was nearly killed as Polaroid stumbled through its bankruptcy proceedings, but Zink got a reprieve and was spun out as an independent company in 2005.

With the spin-off came 50 Polaroid employees, the intellectual property connected to the "zero ink" printing approach, and a vast amount of equipment, including gargantuan coating machines used to apply chemicals to paper. But the company also needed to improve the technology that Polaroid had invented.

"The early photos were almost impressionistic," says Zink chief executive Wendy Caswell. "We needed them to be crisp and durable and stable over time."

After a few delays, Zink now expects that its first products will be available for purchase later this year. One, a printer only slightly bigger than a cellphone, will bear the Polaroid brand name and sell for about \$150. It can produce full-color photos sent from a cellphone via the Bluetooth wireless protocol, or from a camera connected with a cable. Zink expects to make its money selling paper, which will go for about \$3 per 10-pack.

Caswell imagines Zink printers built into all sorts of devices, from digital photo frames to flat-panel TVs. (Much of Zink's funding, including a \$25 million investment last fall, has come from Tom Petters, the Minnesota entrepreneur who also now owns Polaroid. Two other people with connections to Petters Group hold board seats at Zink.)

Konarka Technologies, originally spun out of the University of Massachusetts at Lowell, is developing a flexible kind of solar cell called Power Plastic, aimed at being cheaper to make and lighter than existing solar cells, which are usually made from silicon. Earlier this month, Konarka demonstrated a way to use inkjet-printing technology to produce solar cells. (The company uses inkjets to spray a liquid containing semiconducting polymers, which can convert sunlight into electricity, onto a surface.)

Konarka hired Gaudiana, its first former Polaroidian, in 2001. "By early in 2002, Konarka employed about fifteen people in total," Gaudiana says. "And eleven or twelve of them came from Polaroid." The founding company provided a deep pool of chemical engineering know-how.

Among the spawn of Polaroid, there have already been a few clear wins and losses.

One company founded by a former Polaroid marketing executive, Picasa Inc., developed software to help consumers organize and share their digital photo collections. It was acquired by Google Inc. in 2004, and the Silicon Valley search engine now distributes Picasa's software as a free download. But another Polaroid spin-off, Aprilis Inc., which used holographic imaging technology to record large volumes of data, didn't fare so well. The company's assets were acquired by Dow [Corning](#) in 2006; Dow is now in the process of phasing out the business.

A handful of former Polaroid engineers work at QD Vision, which is developing a new kind of flat panel display that may be more power efficient, using engineered structures called quantum dots. When I spoke with Polaroid alum (and QD Vision employee) John Linton last week, he'd just wrapped up a phone conversation with another alum.

"We're looking for some more chemical technicians," Linton said, "and nothing is better than somebody you've worked with before."

Lynne Garone, a Polaroid alum now working at E Ink, said she keeps in touch with fellow alums through the networking website LinkedIn. About 10 former Polaroidians, Garone said, are now working on E Ink's paper-like display technology. When she arrived in 2001 after 23 years at Polaroid, she said that E Ink "reminded me of Polaroid - bright people working on complicated chemistry. It's the same kind of energy here that was always around Ed Land's labs in Polaroid's research division."

At companies like E Ink and Zink, the legacy of innovation that Polaroid founder Edwin Land began in 1937 has a chance to live on. There's even a conference room at Zink named for Land, and a framed photo of the young Polaroid founder himself, sitting at a microscope - searching, no doubt, for the next breakthrough.

That job is now left to Polaroid's successors.

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