What's Wrong with This Picture: Kodak's 30-year Slide into Bankruptcy

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As Eastman Kodak begins to adapt to the challenges of bankruptcy, David A. Glocker's company, Isoflux, is expanding -- thanks to technology he developed in Kodak's research labs. He didn't steal anything. In fact, before he founded Isoflux with Kodak's blessing in 1993, Glocker approached his managers at the company and suggested they market the coating process he had developed.

"In a nutshell, I went to them and said, 'I think this is valuable technology and it's not being commercialized.... I'd like to do that if Kodak is not interested,'" he recalls. "And they said, 'Fine, do it.'" So he did, in his spare time, for five years while still working at Kodak, then full-time after leaving in 1998. Today, several patents and innovations later, Isoflux is a growing company in Rochester, N.Y., that coats a range of three-dimensional products, from drill bits to optical lenses to medical devices.

The technology is one of countless innovations that Kodak developed over the years but failed to successfully commercialize, the most famous being the digital camera, invented by Kodak engineer Steven Sasson in 1975. Digital technology has all but done in the iconic filmmaker. Since 2003, Kodak has closed 13 manufacturing plants and 130 processing labs, and reduced its workforce by 47,000. It now employs 17,000 worldwide, down from 63,900 less than a decade ago.

When new technologies change the world, some companies are caught off-guard. Others see change coming and are able to adapt in time. And then there are companies like Kodak -- which saw the future and simply couldn't figure out what to do. Kodak's Chapter 11 bankruptcy filing on January 19 culminates the company's 30-year slide from innovation giant to aging behemoth crippled by its own legacy.

Adapting to technological change can be especially challenging for established companies like Kodak, Wharton experts say, because entrenched leadership often finds it difficult to break old patterns that once spelled success. Kodak's history shows that innovation alone isn't enough; companies must also have a clear business strategy that can adapt to changing times. Without one, disruptive innovations can sink a company's fortunes -- even when the innovations are its own.

It wasn't always this way. When Kodak founder George Eastman first began using his patented emulsion-coating machine to mass produce dry plates for photography in 1880, hewas the one being disruptive. For more than a century thereafter, Kodak dominated the world of film and popular photography, with sales surpassing $10 billion in 1981. Ringing up profit margins of around 80%, film drove the company's expansion. Leo J. Thomas, senior vice president and Kodak's director of research, told the *Wall Street Journal* in 1985: "It is very hard to find anything [with profit margins] like color photography that is legal."

Many say film's profitability contributed to Kodak's demise. "I believe the single biggest mistake that Kodak made for two decades or more was the fear of introducing technologies that would disrupt the film business," Glocker says. "There were excellent scientists and engineers at the bench level and through several layers of management who generated some of the world's leading innovations. The company, however, was almost never willing to risk the high film margins by introducing them. The irony is that many -- CCD arrays, digital X-rays, etc. -- eventually did Kodak in."

Kodak was never short on innovation, adds Glocker, but there was a disconnect between the research labs and upper management. When he joined Kodak in 1983, research was funded on what was known as Eastman's nickel -- that is, for every dollar of Kodak film sold, research got five cents. The culture in the labs was "relatively laissez-faire," and research managers often pursued projects for a long time before

management decided whether or not to bring a product to market.

From Glocker's viewpoint, things started changing in the late 1980s when the company tried to align research more closely with business objectives. "The business units were interested in product-driven research rather than technology-driven research," he says. He remembers one time his boss discovered a new coating technology that he presented with excitement to the business units. "The reception was cool, so to speak," Glocker recalls. "Eventually, the funding dried up. We mothballed the equipment and went on to other things." A few months later, the business units showed up at the lab with a competitor's product that used the very technology they had rejected. "The business unit people came to us and said, 'Look at this. Look at what they're doing! Can we do this?'"

Creating and Capturing Value

Companies often have trouble managing innovation, says Wharton operations and information management professor Christian Terwiesch, director of Wharton's Strategic R&D Managementprogram. "Either they are focused on what they currently do and seek incremental innovation, or when they talk of research, they talk about what will happen in 10 years," he notes. "Innovations that reach a middle ground -- such as envisioning new product lines in the next two to five years -- are much more elusive and often don't have a champion pushing for them in the organization."

Another pitfall: knowing where to focus innovation. Innovation is "the match between a solution and a need, connected in a novel way," Terwiesch says. Kodak had a choice in how it pursued innovation: If it focused on the need, it would have to find new ways to take and store photos. If it focused on the solution, it would have to find new markets for its chemical coating technologies. Kodak's competitor, Tokyo-based Fujifilm, focused on the solution, applying its film-making expertise to LCD flat-panel screens, drugs and cosmetics. "You have to make a decision: What are you as a company? Is it understanding the need or understanding the solution?" Terwiesch asks. "These are simply two very different strategies that require very different capabilities."

When disruptive technologies appear, there is a lot of uncertainty in the transition from old to new, according to Wharton management professor Rahul Kapoor. "The challenge is not so much in developing new technology, but rather shifting the business model in terms of the way firms create and capture value." For years, Kodak operated under the classic razor blade model: Like blades to razors, Kodak made most of its money off film, not cameras. When the company began to shift to digital, it "thought of digital as a plug-and-play into Kodak's existing model," Kapoor says. The company didn't envision making money off cameras themselves, but rather the images it assumed people would store and print. "If you look at R&D, they were superfast. In terms of the business model, they were quite the opposite."

Kodak failed to build a strategy based on customer needs because it was afraid to cannibalize its existing business, suggests Wharton marketing professor George S. Day, co-director of Wharton's Mack Center for Technological Innovation and author of *Strategy from the Outside In.* "It succumbed to inside-out thinking," says Day -- that is, trying to push forward with the existing business model instead of focusing on changing consumer needs. Accustomed to the very high film margins, the company tried to protect its existing cash flow rather than look at what the market wanted. "Long-run strategies work better if you stand in the shoes of your customers and think how you are going to solve their problems," Day noges. "Kodak never really embraced that."

The company's isolation probably didn't help, Day adds. "They had a very insular culture, sitting up there in Rochester." The company might have been able to innovate more quickly on the digital front if it had set up a separate lab in Silicon Valley, then allowed it to grow independently and tap into the area's tech culture and expertise. Instead, Kodak "got sucked into the Rochester environment. They recognized the threat, but tried to deal with it on their own terms."

This view is shared by Kodak insiders as well. Some people in the company saw a need for change but they couldn't make it happen, says John Larish, a photography writer who worked at Kodak from 1969 to 1984 as a senior markets intelligence analyst. He recalls efforts in the 1980s to drive innovation by setting up smaller spin-off companies within Kodak, but "it just didn't work." Venture companies in Silicon Valley are "pretty wild," Larish adds. "In Rochester, people come to work at 8 and go home at 5."

Kodak was invested so heavily in film technology that it became difficult to abandon, according to Robert Shanebrook, who worked at Kodak from 1969 to 2003 and has documented the process in his book, *Making Kodak Film*. Shanebrook began his career in Kodak's research labs, working on the camera that Neil Armstrong used to snap photos of moon rocks. Later, he worked on a project using liquid crystals to create electronic photographs. In 1975, he moved to the company's photographic technology division to work on black-and-white emulsion film because the company didn't seem focused on developing digital technologies. "They told me it was going to become increasingly difficult to fund my projects in the future," he recalls. At the time, "they weren't particularly interested in the digital photography stuff."

Over the years he watched digital projects lose battles for research dollars. Even though film's market share was declining, the profit margins were still high and digital seemed an expensive, risky bet. "It would have been difficult to just give [film technology] up," says Shanebrook. "It meant abandonment of the entire capital structure." Kodak's core competency was being a vertically integrated chemical manufacturer, he adds. "The core competency of being a digital camera manufacturer is electronic.... Trying to convert from being a chemical company to making digital cameras -- which are like computers more than anything else -- you wouldn't expect [Kodak's expertise] to be there."

Nevertheless, it would be wrong to say that Kodak wasn't extremely active in digital research, Shanebrook notes. "They were very, very aware" of digital technologies. "There were people who did nothing but watch the evolution of digital imaging. That's why Kodak has so much intellectual property in the area."

Refocusing the Company

In January, Kodak filed patent infringement lawsuits against Apple and Research In Motion (RIM), claiming the iPhone and BlackBerry devices infringed on Kodak's digital imaging technology. Kodak inventors earned 19,576 U.S. patents between 1900 and 1999, and the company holds a portfolio of more than 1,000 patents in digital imaging alone. The company now hopes to sell some of those patents as part of its restructuring.

Kodak's legacy goes beyond patents and capital equipment. In the U.S. alone, the company also has 38,000 retirees and up to $200 million per year in health care, insurance and pension obligations, says Bob Volpe, president of EKRA, a Rochester-based association of Kodak retirees. Chief executive Antonio Perez has vowed to "right-size" the company's legacy operations, Volpe points out. "Retirees are the center of the target. We're in the bull's eye of the company's efforts to reduce costs."

Kodak could have avoided this fate if it had used the resources it earned during better times to acquire the technologies it lacked, says Wharton management professor Saikat Chaudhuri. The company made a number of acquisitions over the years, but most were "bit players" that didn't help Kodak gain an edge. "They should have gone for one of the electronics manufacturers. It's better to cannibalize yourself in a calibrated way than to let others do it to you." The problem was that Kodak had built up a lot of inertia and could not react quickly. "Those very systems that serve you well and allow you to build your lead -- once conditions change, they become a rigidity in and of themselves."

On top of foot-dragging into the digital world, Kodak had become "bloated" in its heyday, and didn't know how to scale back during the past decade, according to Wharton operations and information management professor Kartik Hosanagar. "It was never clear whether Kodak wanted to be a products company or a services company. Or a consumer company or a B2B company," he says. "The lack of a clear strategy for digital coupled with being in too many areas led to the current situation. The confusion was also visible in its M&A work. Acquisitions have been all over the place."

Kodak will need to streamline going forward, Hosanagar adds. It is "in too many lines of business. A struggling company like Kodak has no business being in so many areas. It needs to articulate a clear strategy and figure out whether to focus on the consumer or business segment and which specific divisions within that segment."

Wharton management professor David Hsu agrees. The digital era pushed Kodak into "a position of reacting," and the company seemed to lose focus. "They had reorganization efforts ... [and] brought in CEO after CEO. When you have that much disruption and change," it becomes difficult to implement a

long-term strategy, Hsu says. Going forward, Kodak has to figure out what its business is going to be, and focus on that. "It's okay to specialize in one part of the value chain.... They can't be the best at everything. It's a moment in time where they should put their start-up hats on and refocus the company."

It's business advice that Glocker of Isoflux is taking to heart. As his company has grown, other start-ups have emerged with new technologies for coating complex shapes. Glocker's team is now exploring the possibility of investing in those technologies, even if it means using its own technology less. "It wouldn't hurt my feelings to bring [the technologies] in house and learn how to do it." After all, he figures, his customers don't really care which technology he uses -- they just want to get the job done. It's a lesson he learned from watching Kodak: "Don't assume that just because you're not willing to do it, somebody else won't."