

E-Ink in 2007: Case Study

The nature of the opportunity confronting E-Ink (www.eink.com) is potentially vast, but not necessarily so. The concept of “radio paper” is a technology that proposes to do what so many other electronic technologies have tried and failed to do; displace paper as the general medium for reading material. Regardless of the feasibility of that particular goal, E-Ink is also applicable to myriad other applications, including screens and signs. This opportunity is risky because E-Ink is the first innovator and must bear the entire costs of R&D prior to establishing an actual market for the product. On the other hand, many of the potential applications of E-Ink are not disruptive, but complementary, and can therefore be more easily converted into revenue. E-Ink must therefore strike a balance between complementarity and disruption; between serving existing demand and creating new demand.

E-Ink’s 3 stage strategy attempts to strike this balance, beginning by attacking two established markets for large area displays and flat panel displays. This strategy was chosen in order to generate short-term revenues without distracting from the ultimate goal: radio paper. E-Ink was highly wary of any “distractions” along the way to radio paper, even if those distractions were profitable. E-Ink was wary of competitors entering the innovation market and leapfrogging E-Ink to reach radio paper first. Therefore E-Ink management drove their team and investors towards radio paper without spending much time exploring profitability in more immediately accessible markets, a strategy that carried its own risks.

First and foremost, where competing in established markets for display technologies is relatively low risk, the market demand for radio paper has not been empirically established. The fact that the publishing industry is 135 billion dollars and that having to switch books on the beach is a mild annoyance does not a compelling market case make. Simply put, people like books for reasons that are not all rational, but neither are they entirely sentimental. Books are cheap, semi-disposable, low-maintenance products. They have attractive covers that advertise to other people what you are reading. They form part of a personal library to which one forms emotional attachments. And most importantly, they have multiple pages; they have a beginning and an end. To exchange that for a system that is more expensive, sensitive, and devoid of emotional attachment will be a trick of consumer education. And I’d point out that E-Ink doesn’t actually solve the book-at-the-beach problem; Jacobsen can leave a cheap novel by his chair at the beach and not worry about somebody stealing it. If people were really irritated by running out of things to read at the beach, wouldn’t there be more bookstores at beach resorts?

That does not mean there is no area in which E-Ink might displace the traditional book- translation and research applications spring to mind- but the argument that radio paper represents an unquestionable “pot of gold at the end of the rainbow” has a lot of holes. For example, this invention is so disruptive as to destroy large segments of that \$135 billion industry, in particular, printers, binders, paper-makers and so on. These industries will fight with their backs to the wall. They may exploit their relationships with content providers to block E-Ink from entry.

An alternative route would be to thoroughly explore the low end of the market for undetected opportunities before committing enormous amounts of cash (\$50-100 million!) towards developing a product with untested demand and established competitive risk. Developing an entire corporate strategy based on a deliberate ignorance of new, developing, and undiscovered customer requirements in order to pursue the fanciful use-case of its founder seems like market tunnel vision. E-Ink could enable entire new classes of hardware designed specifically to support its unique

features. E-Ink will also depend heavily on content delivery systems and on having content to deliver. Large area displays and flat panel displays provide little alliance advantage beyond revenue.

Therefore E-Ink should pay particular attention to the quality of its investors and production alliances. If E-Ink proposes to enter the publishing market, establishing relationships with content providers is key. E-Ink should also look at companies that might want to create content specifically tailored to take advantage of the E-Ink format. Books and newspapers are not, after all, the only type of publication that might be able to use E-Ink. Restaurant menus at international hotels (or on airlines) might be an even better application (provided you could waterproof the menus).

E-Ink, however, is still positioned well, thanks to the investment in R&D and the relatively high degree of protection the patent system will provide this product. E-Ink both has the patents and the money to defend them, so it has created strong barriers to entry and strong motives for investment.

Therefore E-Ink can raise money. How much and how should it do so? E-Ink has already established costs for entering each of its three target markets; the high side estimate is \$20 million to attack large area displays, \$50 million for flat panel displays, and \$100 million for the publishing market. I would suggest cannibalizing \$50 million from the \$100 million investment in publishing and using that funding to explore alternative applications, particularly in the medical market, which is swamped with cash and yet still faces challenging information integration requirements related to integrating paper-based and electronic data. For example, imagine integrated wireless E-Ink patient charts that can be filed like ordinary paper. Mapping is another potential market for E-Ink; my car is loaded to the brim with maps that are all slowly disintegrating and going out of date. Suffice it to say I have no emotional attachment to them. And as a backpacker, I would love to have an electronic map that is lightweight and has minimal power requirements.

E-Ink has to hand a large number of investors providing it with free market research, requirements, and use-cases. E-Ink's strategy is to largely ignore this valuable resource, which I believe is a mistake. E-Ink should also explore strategies for entering emerging markets where books and paper are not ubiquitous (or cheap), yet demand for timely information delivery is high. Asia, in particular, has a different consumer attitude towards small displays and portable devices, and E-Ink's radio paper may prove more popular there than in the US, much like cell phone web browsers.

Given E-Ink's budget estimates, E-Ink needs \$3.2 million dollars per quarter to continue functioning. E-Ink is wary of investor burnout should this fail to begin moving E-Ink towards break even within 5 years. Therefore a lot rests on producing revenue from the first two stages and E-Ink needs to be very careful to court investors who can help E-Ink address these markets, because without stage one and two, there is no stage three.

At the same time, E-Ink must be wary of diluting its equity or allowing investment by potential competitors who would seek to leverage their equity to block E-Ink's disruptive attack on the publishing market (or other markets). Some of these investors may see a potential disruption from E-Ink not yet perceived by E-Ink; another reason for more market research and development. Therefore E-Ink should be particularly wary of "call options" from certain investors.

As a rule, E-Ink should try to solicit investment from those who stand to benefit from it the most, namely hardware manufacturers, systems developers, and content providers. VC capital should be used for leverage. Ideally profits from the first two phase businesses will help sustain E-Ink into radio paper, because making a \$100 million dollar investment in this technology using other people's money might leverage the company to the hilt with expensive capital.

E-Ink should also consider licensing the technology. At the moment E-Ink's strategy is to develop E-Ink as a manufacturer. With an unlimited amount of cash this might make sense, but mass manufacturing is expensive. Also, it inhibits cooperation from other companies who might be more inclined to adopt E-Ink display technologies using their existing manufacturing capabilities.