E-Paper, LED, OLED, and the Strategic Positioning of Hardware Vendors and Publishers: What It Means to Libraries

Stephen Patton
Delta State University, spatton@deltastate.edu

E-PAPER, LED, OLED AND THE STRATEGIC POSITIONING OF HARDWARE VENDORS AND PUBLISHERS: WHAT IT MEANS TO LIBRARIES

Stephen Patton (spatton@deltastate.edu) - Electronic Services Librarian, Delta State University

ABSTRACT

Currently Amazon and Apple are the two dominant players in the e-reader arena. The Amazon Kindle's electrophoretic display makes it a lighter and more efficient reader platform. Apple has a large customer base and its iPad hardware is a multiuse tool and further more publishers are signaling interest in producing their e-books in a multimedia app format. Currently, LED technology limits the iPad due to weight and battery life. Organic LED (OLED) may be poised to provide a solution to the disadvantages of both e-paper and LED in one device with some new compromises. In understanding the direction of the development of these e-reader platforms, libraries and publishers will be better informed to strategically position themselves and their collections for the future.

INTRODUCTION

While libraries are stakeholders that will continue to be greatly impacted, they will in fact have little effect on the speeding train that is the e-reader market. As librarians, our best recourse is to be fully informed on both the technology and the market, particularly since some are proposing that physical collections are increasingly obsolete and cost prohibitive.

UMPCS (ULTRA MOBILE PERSONAL COMPUTERS)

The modern e-reader and the cultural acceptance of these types of devices were greatly affected by the reaching of a heat and energy efficiency threshold in the mid 2000s, which impeded Moore's Law.[1] To compensate, chip manufacturers and developers turned their attention to heat reduction and energy efficiency. These advances in heat reduction allowed for processors to be passively cooled and the advances in energy efficiency led to increased battery life. With these innovations many manufacturers then turned their attention away from the PC market to start experimenting in the UMPC (Ultra Mobile Personal Computer) market. UMPCs finally started delivering on the functionality that customers always wanted in a PDA. These devices were small, had long battery life, and were highly specialized. The modern e-readers caught on in great part because of the penetration of UMPCs in the consumer market.

DISPLAY TECHNOLOGY

E-readers are able to make gains in battery life and user productivity through specialized display technologies. At the moment, the Amazon Kindle implements one of the most efficient display technologies on the market: the electrophoretic display, or e-paper. These displays can be flexible, which can potentially allow for a scroll unit that can be unraveled from a tube and greatly increase your display area.

---

[1] Moore's Law is a" broad principle relating to the rate at which the density of transistors in integrated circuits, and hence the power and miniaturization of computers, is expected to increase with advances in microchip technology, originally predicted by Moore as approximately doubling every year (now modified to approximately every two years)." See the definition of Moore's Law in the *Oxford English Dictionary*. "Moore's law, n.". *OED Online*. November 2010. Oxford University Press (accessed January 20, 2011).

The Apple technologies (i.e. the iPad and iPod Touch) utilize LCD displays, which are highly energy inefficient and brittle. To increase the energy efficiency of LCDs, manufacturers are beginning to utilize transflective technology. This technology allows you to replace inefficient backlighting with ambient reflected light. Apple's implementation of LCD has mainly been focused on video display, whereas Kindle's e-paper, though highly energy efficient, is solely black and white. Color displays have an obvious advantage over e-paper. For example, a children's book would lose something in a black and white display.

Reader focused devices will hopefully move toward Organic LED (OLED). This technology will lower manufacturing cost, is flexible and durable, and could increase energy efficiency by 30%-40%.[2] However, combining the technology of OLED and transflective displays would create a far superior product for reading.

AMAZON AND APPLE

The differences between the Amazon Kindle and the Apple devices do not end at their displays. These two companies are positioned differently but both have their merits. Amazon has an incredibly large retail customer base. Many consumers already purchase physical books through Amazon. Amazon has already worked out agreements with many of its publishers and its Kindle application is now on Apple products and PCs as well. Apple, obviously also has a large customer base. However, they are just beginning negations with publishers. Their main focus up to this point has been mainly on multimedia. Apple is many times larger than Amazon.

DEVELOPERS

Amazon is using the Android operating system on its Kindle platform. Android is currently capturing a great deal of interest from developers.[3] Amazon only recently released the standard development kit for developers to start creating applications for the Kindle. Apple is more established in the app market than the Kindle could ever hope to be.

It is important to watch the movement of developers because they are a stakeholder that can make or break a platform. While Android is becoming more ubiquitous in all UMPCs, the hardware platforms are not as refined and unified as Apple's, which makes cross platform development difficult.

PUBLISHERS

While all of this may seem unrelated to libraries, it is important for publishers who are trying to decide where to release their content and where to invest their development dollars. Publishers may be wary of releasing their content in a static e-book format since e-book DRM (Digital Right Management) is easily cracked. Publishers have seen the damage that pirating has done to the music industry. At this very moment pirates have posted thousands of Kindle e-books for download.

Publishers should instead focus their energies on application development. Releasing their content in their own secure application allows them to mitigate their losses from piracy, since they only upload portions of their content encrypted during a session. Also, since the content is not statically held they can make sure to keep up with modern encryption techniques. You can never make it impossible for pirates to steal content, but you can make it tedious enough to be a

---

[2] Jon Stokes, "This September, OLED no longer "three to five years away," *Ars Technica* (August 11, 2009), Retrieved January 15, 2011 from http://arstechnica.com/gadgets/news/2009/08/this-september-oled-no-longer-three-to-five-years-away.ars.

[3] Sarah Perez, "Developers Report Increased Interest in Android, Tablets for 2011," *ReadWriteMobile* (January 25, 2011). Retrieved January 10, 2011 from http://www.readwriteweb.com/mobile/2011/01/developers-report-increased-interest-in-android-and-tablets-2011.php.

deterrent. Applications will also allow publishers to distribute a whole new multimedia experience. They will also be able to add content and edit on the fly. This will lend itself to a reoccurring subscription service, instead of a one time purchase.

PROJECTIONS

Once the dust settles between Android and Apple, publishers and database vendors will know where to focus their attention. It is possible that publishers might move to a micro-advertising based model, which could give libraries access to all materials. It would be up to librarians to sift through and make judgments on what are the best applications at the moment that also have the richest content with the least advertising. Or, libraries can have a more traditional model and require reoccurring subscriptions and then be a pooled resource for consumers that may only use content once in a while and not enough to purchase subscriptions.

The days of have static content on our shelves, which do not have a reoccurring cost may be coming to an end. The major stakeholders to watch in the coming days are the companies that produce the platforms, the developers, the consumers, and the publishers.