

Digital Cinema in 2007



Michael Karagosian

Karagosian is the founder of MKPE. He is the senior consultant to the National Association of Theatre Owners on digital cinema technology and policies and remains an active leader in the digital cinema standards effort. He was an advisor to the UK Film Council in the UK government-financed rollout of digital cinema. He was a founder and former president of Cinema Group Ltd., and is a former Advisory Board member of Digital Harmony, which pioneered the use of IEEE 1394 for media applications. Early in his career, Karagosian led the development of cinema and studio products at Dolby Laboratories; he also led the development of networked audio and control systems for Disney theme parks.

By Michael Karagosian, MKPE Consulting

Digital cinema as a technology continues to mature. Twelve of the more than 30 documents in progress in the DC28 Technology Committee for Digital Cinema were published in 2006, while the count of documents in queue continues to grow. Early equipment has been installed in the field, with approximately 10% of screens expected to be converted to digital by the end of 2007. An informal “interop” effort is thriving, where manufacturers and service providers agree on the degree of standards implementation enacted while achieving interoperability. Digital 3-D movies are out-performing their 2-D versions at the box office, accelerating the installation rate for digital 3-D cinemas. That’s the good news.

Technical challenges remain, however. The interop effort will not achieve SMPTE compliance for digital cinema distributions until the 2008 timeframe at best. This timeframe includes compliance to the specification produced by Digital Cinema Initiatives (DCI), a consortium of the major motion picture studios. A method that could become a standard for uniform 3-D distribution has only recently surfaced, possibly pushing the 3-D interop effort beyond 2008. As more experience is gained with installed systems, more is learned about the behavior and feature-set required for widespread acceptance of the technology. Those features include interoperable show playlists and schedules, timed text (and graphics) to support existing and emerging personal captioning systems, and channel-labeled audio for flexibility in multichannel sound and assistive listening systems. Theaters frequently reassign movies from auditorium-to-auditorium, based on consumer demand, and digital systems that can provide this capability in a manner faster than film are only beginning to be tested in the field. Current systems are slower than film in this regard by nearly an order of magnitude. In addition, the integration of electronic advertising in digital cinema playback devices has yet to be widely tested.

Workflow problems in the supply chain are also receiving attention. Today, security keys are delivered by means of USB flash drives or by e-mail—of which neither method is scalable to the 6,000+ cinema sites in the U.S., let alone the rest of the world. No industry specification exists for a common, low-cost method of delivering security keys to cinemas, both in the U.S. and internationally. DCI requires modems to be installed in theater systems for this purpose; however, not all studios favor the modem. It is also not favored by exhibitors, due to the fact that it isn’t a forward-looking technology and does not lead to the lowest cost solution. Most parties favor network delivery methods, but the industry has yet to decide on an interoperable method for network delivery.

Delivery of security keys is only part of the problem, though. Keys are tied to equipment, therefore it is critical to know which equipment is located at each site. This is not a simple task, because maintenance and operational requirements can cause this equipment to change at inconvenient times. For digital cinema to truly scale to cinemas worldwide, the business of

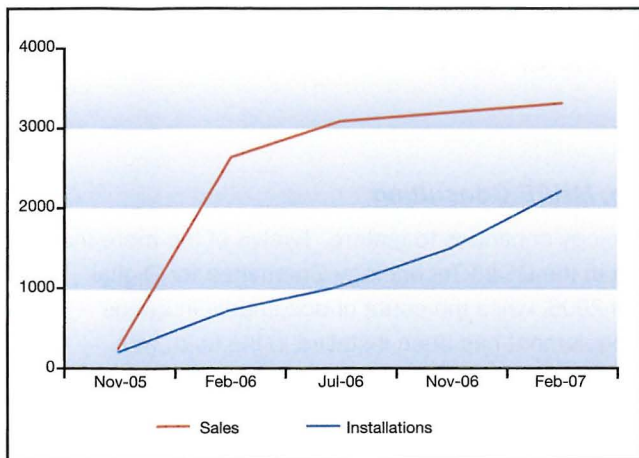


Figure 1. Sales and installations of 2K digital cinema systems.

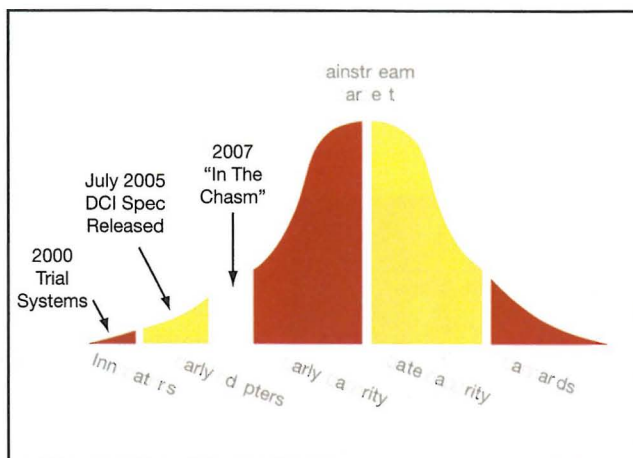


Figure 2. Technology adoption curve.

delivering security keys must be automated, and must be responsive to last-minute changes. To achieve this level of performance, much work remains in the area of security key delivery.

The business side of digital cinema has notably moved forward, but still has its challenges. While the number of digital cinema installations has grown substantially, we can expect the growth in installations to taper off in late 2007, as installations catch up with sales. The sales and installation curves for 2K systems are shown in Fig. 1. Future growth will hinge largely on digital 3-D systems and the acceptance and readiness of the major exhibitors.

Economically, the motivation and timing for the adoption of digital cinema technology is driven by two factors:

- the desire of studios to lower the cost of distributing motion pictures, and
- the desire of exhibitors to buy-in at the lowest cost to business.

For exhibitors, the lowest cost to business is determined by the cost of equipment, the cost of maintenance, cost of operations (positive or negative), and any offsets that can be applied through a subsidy-like mechanism. The willingness of major motion picture studios to seed digital cinema through the subsidy-like virtual print fee (VPF), along with improved pricing of equipment, has aided in accelerating adoption. However, the cost to business can still be substantial, considering the increased cost of ownership that digital cinema equipment imposes. Conservative estimates indicate that the cost of ownership over a 25-year period will be 200 to 400% higher for digital than for film equipment,

due to the shorter lifetime of digital equipment, and the higher cost to purchase and operate.

Geoffrey Moore, in his 1991 book "Crossing the Chasm," attempted to capture the adoption pattern of new technologies. His method of looking at the marketplace identifies clear stages where a change in tactics or technology is required for sales to grow, driven by the unique customer requirements of each market segment. These changes can be as simple as revised pricing, or as complex as requiring a different design approach. Digital cinema technology adoption maps neatly onto his curve, as illustrated in Fig. 2.

This year (2007) finds digital cinema clearly in "the chasm." While digital cinema has experienced a successful early adopter stage, sales have slowed and the major market exhibition players have yet to seriously adopt, although much has been said about the major market ramping up in 2008. Crossing the chasm to reach that market requires many, if not all, of the issues identified in this article to be addressed. As a result, by year-end we will witness a flattening of the hockey-stick installation curve. Next year (2008), though, could be a very different year.