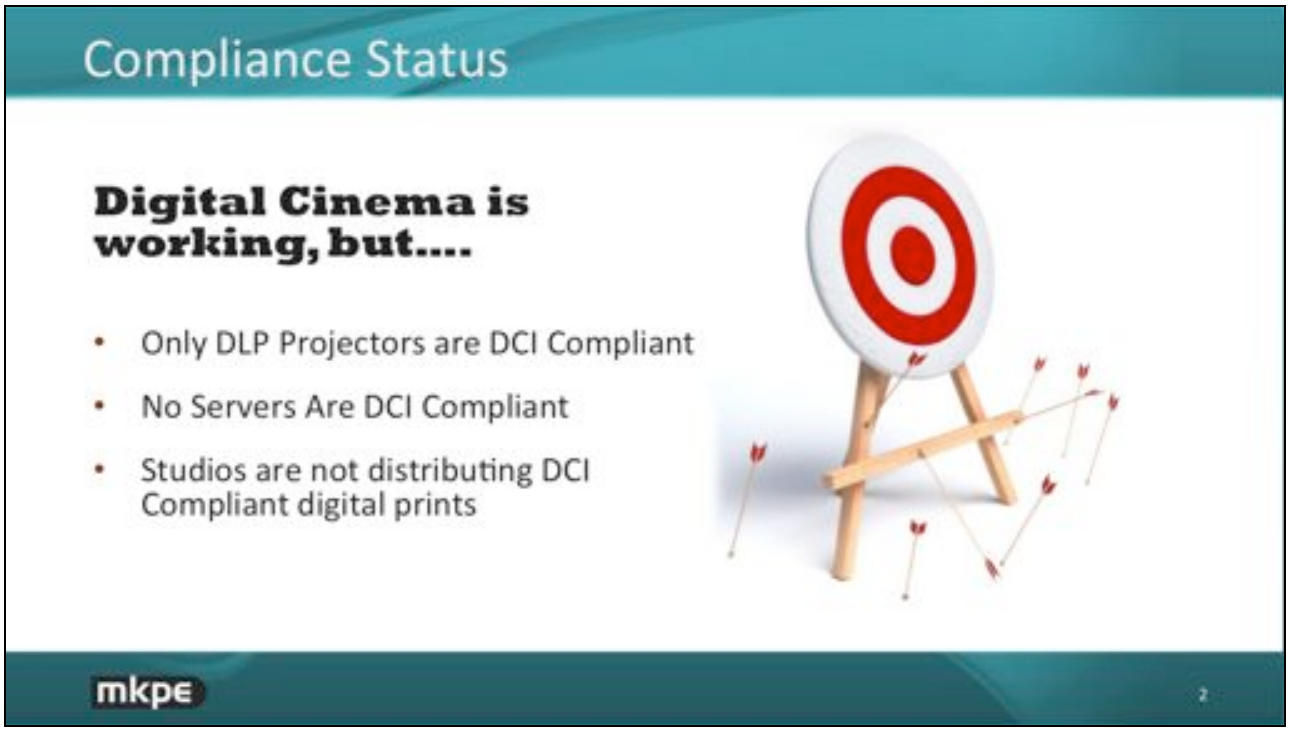
I'm Michael Karagosian, president of MKPE Consulting. We are business consultants for new technologies in cinema.

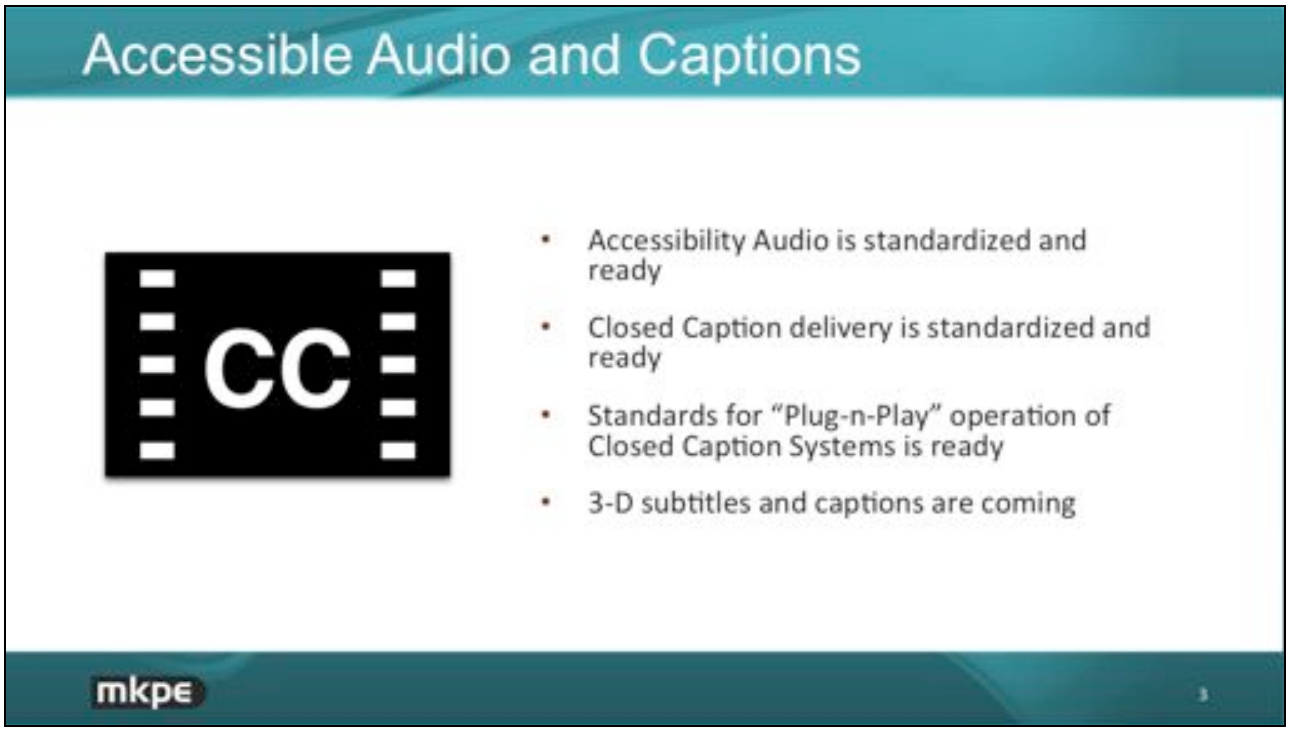
Over the past few years we've been working on digital cinema deployment agreements in various parts of the world, while still very much involved in technology development. Today I get to show you my crystal ball for digital cinema technology.



With all of the talk of standards and DCI compliance, it may surprise some of you to learn that the majority of equipment in use today misses the target.

No servers are DCI compliant. Only one projection technology – DLP – has passed DCI compliance testing. Studios themselves still rely on the non-standard Interop distribution format.

The bar is high, and equipment will continue to strive to meet the bar in the coming years.



Accessibility is no longer in the future: it is here today, whether using the Interop or SMPTE DCP distribution formats.

Most if not all equipment today has implemented standard "plug-in" technology that allows 3rd party closed caption systems to simply plug in and work.

The one area that is missing is 3-D subtitles and captions, both open and closed. The standards effort for 3-D captions is now ramping up, and should be available in all equipment in a few years.

Motivation for Change

- Lower cost of services
- Lower cost of ownership
- Improved performance

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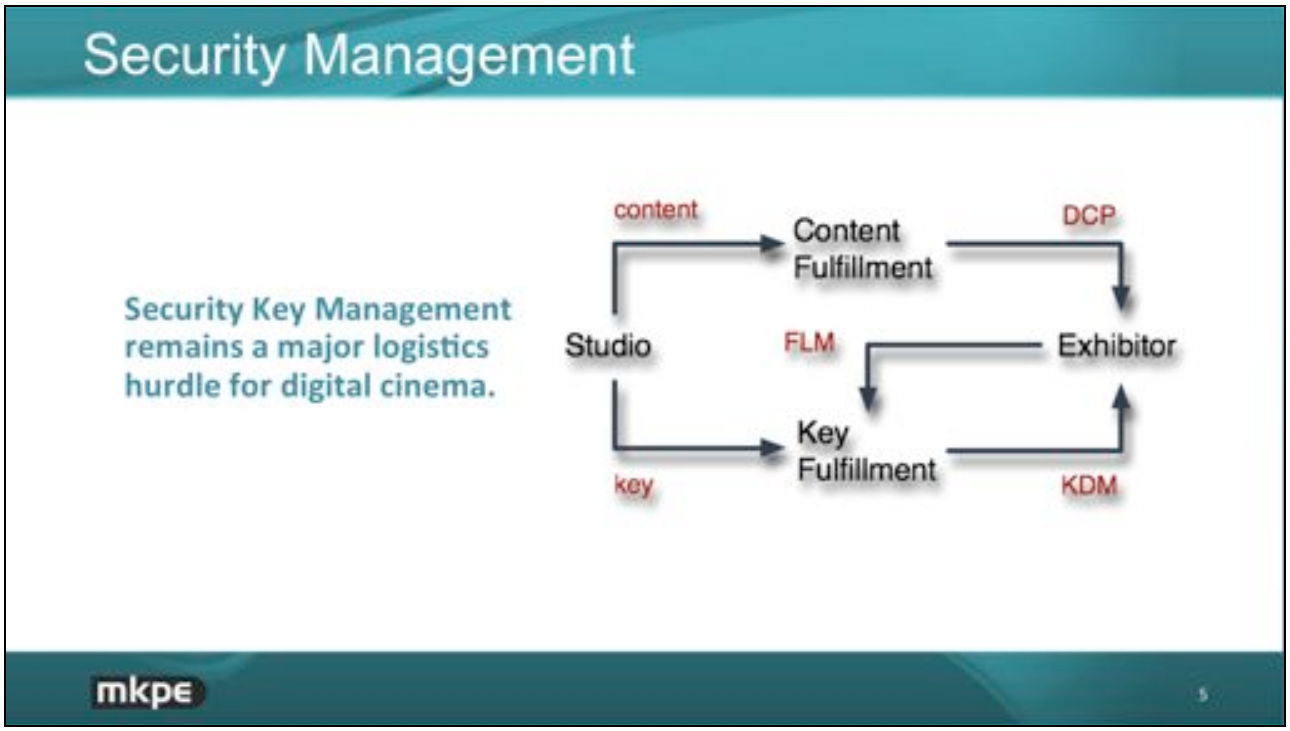
Any movement forward in technology will have to provide a benefit, such as a lower cost of service, a lower cost of ownership, or an improvement in performance.



An area that has long been overdue for improvement is the area of security key management.

While the industry is successful in moving content and security keys to exhibitors, the process for managing keys is not efficient. To generate the correct keys requires up-to-date knowledge of the equipment at the site. In many cases this process requires phone calls, which is very costly on both ends.

A better way is to collect information is through use of a Facility List Message, or FLM. One studio, Fox, is actively moving down this path. As this effort grows, it will become a major step towards bringing seamless security key management into the workflow.

Improving the cost of systems is on everyone's mind. It's difficult to provide further reductions in the cost of the projector. Media blocks must move into projectors to support 4K. It was hoped that this step would lead to commoditized media blocks, and allow for the use of off-the-shelf servers.

I chaired the Common Media Block Interface group, or CoMBI, in which all manufacturers participated as we explored the potential for such collaboration. The result is that each manufacturer has heavily invested in different paths, and it will be a long time before a common media block emerges.

What is more likely to evolve first is a concept that I call "Cinema In-A-Box." The integration of various software used by the cinema may not be challenging to larger exhibitors that can afford an IT staff. But smaller exhibitors need more integrated solutions.

It's a fair prediction that one or more software companies will move down the path of integrating into one product family the SMS (server), TMS, Back Office, Enterprise office, and possibly the POS (for schedule management).

Projector Technology

- Reduce bulb costs
- Reduce power consumption
- Improve light levels for LCOS

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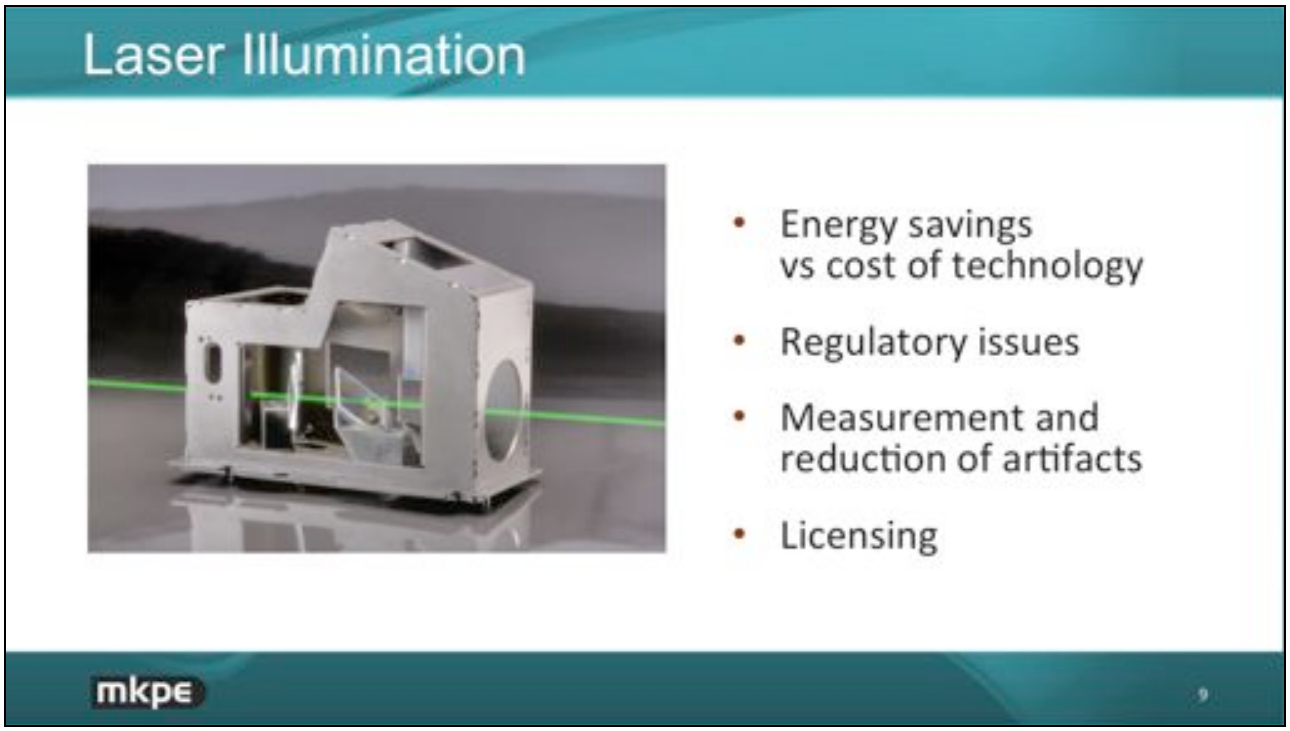
If it's difficult to improve the cost of the projector itself, then improvements in projection technology will focus on bulb costs, reduction of power consumption, and improved light levels for some imaging technologies.



The technology that is receiving a lot of attention in this space is laser illumination. Kodak, Barco, Sony, and Laser Light Engines have each announced their work in laser technology.

But there are challenges to address.

The technology must be cost effective.

It must overcome regulatory issues.

This technology is so new that accepted measurement techniques do not yet exist. For manufacturers to guarantee performance, and users to compare products, measurement techniques must be in place.

Licensing issues remain. A US patent search will reveal a few thousand patents in this area. Changes in the prism of TI projectors, as demonstrated by Kodak in the photo, require approval of TI, who includes the prism in the license of DLP Cinema technology.

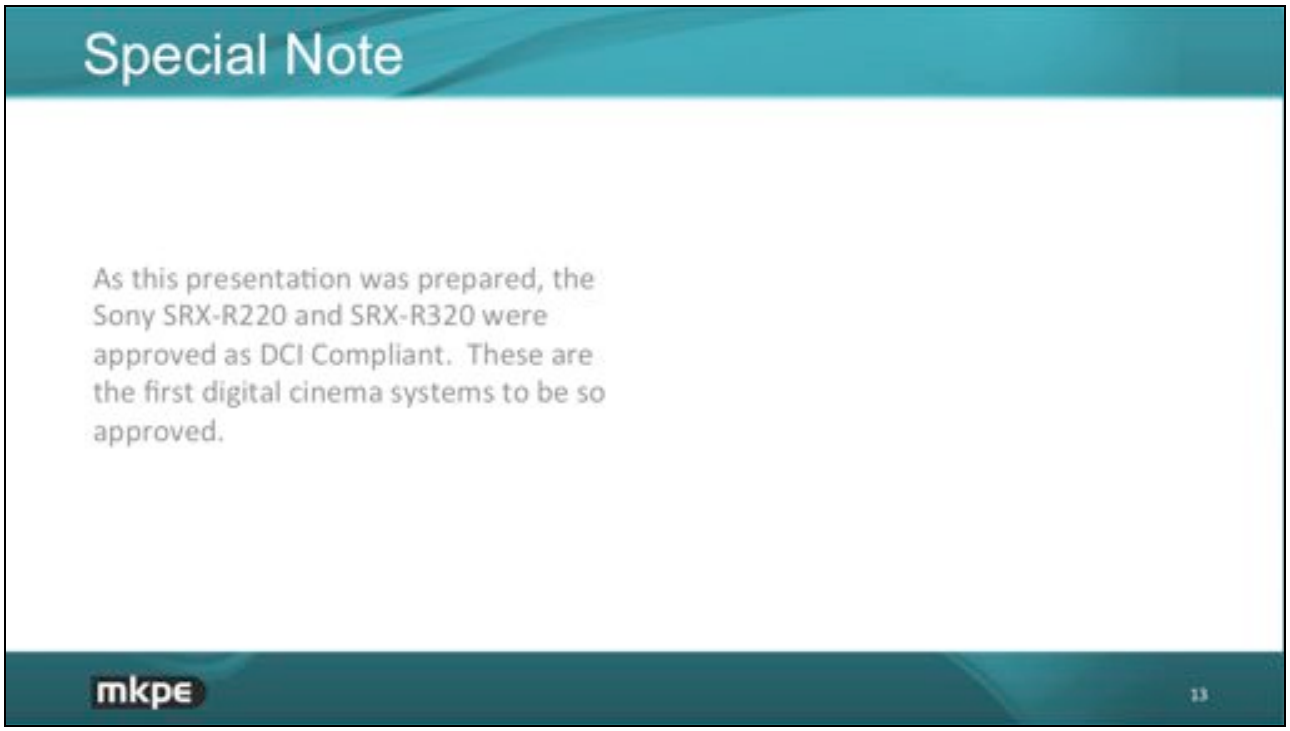
After 12 years of intense focus on digital projection, it's refreshing to see the revived interest in extended sound systems. A core benefit of digital cinema is that it supports 16 uncompressed studio-quality sound tracks, out-of-the-box.

Specialized sounds systems have been demonstrated, as well, including Iosono and Auro 3D. Disney introduced a new 7.1 sound format with several movies last year. We should expect to see further extensions of sound in the future.

When it comes to areas where improvement could take place, screen technology is often overlooked. Perforations in screens exist to allow sound to travel through. But perforated screens lose valuable light, and the rectangular pixel pattern of the projector can beat against the rectangular perforation pattern, causing moire patterns in some installations.

This topic has been hot in high end home installations, where there is strong debate over the use of solid screens, perforated screens, or the newer woven screens. In appreciation of the problem, some exhibitors have installed solid screens in their auditoriums, with speakers surrounding the screen. If demand is there, screen technology is another area where changes could occur in the coming years.

That wraps up my presentation. Thanks for your time and interest. This presentation is available online at mkpe.com. Those who wish to keep up on advances in digital cinema can subscribe to mkpeReport, a unique monthly publication that is designed to keep you current.



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