



The End of the Rollout is Near and What That Means To You

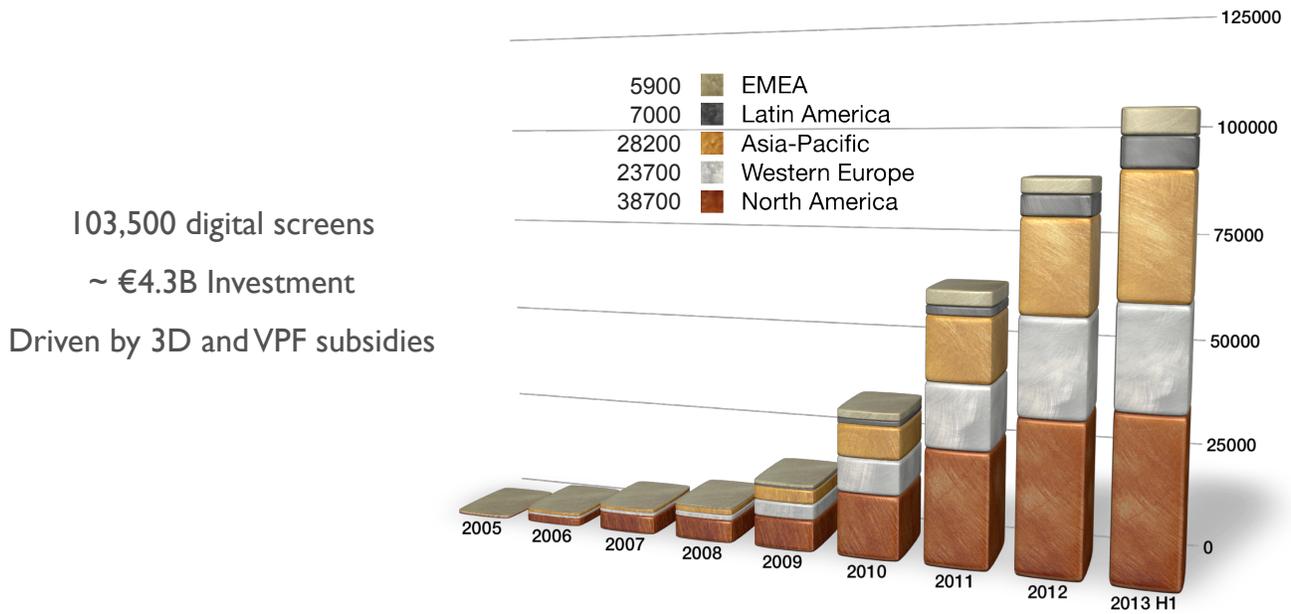
Michael Karagosian
MKPE Consulting LLC
August, 2013



I'm Michael Karagosian, president of MKPE Consulting in Los Angeles. I've been engaged in developing business and technology in the cinema industry for over 30 years, and since 1999 have played an active role in the development and rollout of digital cinema. I led the technology effort within NATO for 11 years, and worked closely with DCI. I've also consulted to many of the companies in this industry as they developed their strategies in digital cinema, and continue to consult within the industry. My most recent work in this space has been the negotiation of virtual print fee subsidies in Ireland, Philippines, and throughout South America. The cinema industry has made tremendous movement in the conversion from film to digital projection. In this presentation I will share some insights about the future of cinema technology as we approach the conclusion of the rollout.

Worldwide Growth

All figures rounded from July 2013



The worldwide growth of digital cinema screens has been astounding. We experienced a sequential growth of about 30,000 screens over the past two years, and today [August 2013] there are just over 100,000 digital cinema screens in the world. The chart breaks down the number of installations at the end of July 2013 by region.

Market Conversion

83% World Market Converted

94% US Converted

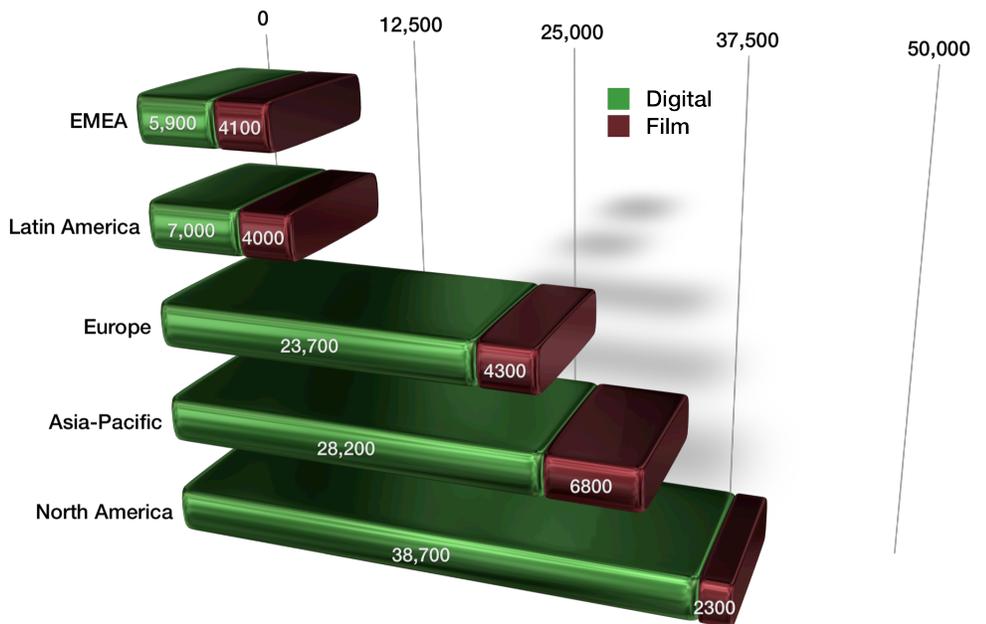
45% of World Screens are 3D

22% of World Screens are 4K

36 Countries DCP Only

est. 65 Countries

DCP Only by Mid-2014



This slide presents a different view of the data, giving us a view of how far along the transition is. The green bars represent the number of digital installations, and the red bars represent the number of screens by region that remain to be converted. The numbers in the chart indicate the number of screens converted or that remain to be converted in each region.

Most regions are very far along. The regions where a high percentage of growth is needed most is Latin America and the EMEA regions. Most of the growth in Latin America is that of Cinepolis and Cinemex in Mexico. Countries such as Brazil need to move quickly to catch up.

Overall, the world's cinemas are now about 83% converted, with approximately 45% of digital installations 3D capable. 36 countries now receive only digital prints, and that number is expected to climb to 65 countries within a year.



Is 100%
Conversion
Possible?

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Currency Exchange

Rule of Law

Tight Economies

Expensive Capital

If you're an exhibitor, and you haven't converted, then there's a cloud hanging over you. The remainder of the world's screens to be converted are not the low hanging fruit. With the exception of 3D, digital projectors do not generate new revenue, and not all countries are ready to invest such large sums in equipment that only sustains current business. In some countries, the transition is also challenged by government control of currency exchange rates, which not only pose problems for the major distributors that would otherwise provide a subsidy, but also for manufacturers, as most if not all digital cinema equipment is priced in US dollars. Further, some territories are simply not considered safe enough to set up operations by some digital cinema deployment entities.

35mm Print
Film
Stock Is
Vanishing

Kodak

FUJIFILM

AGFA

Agfa

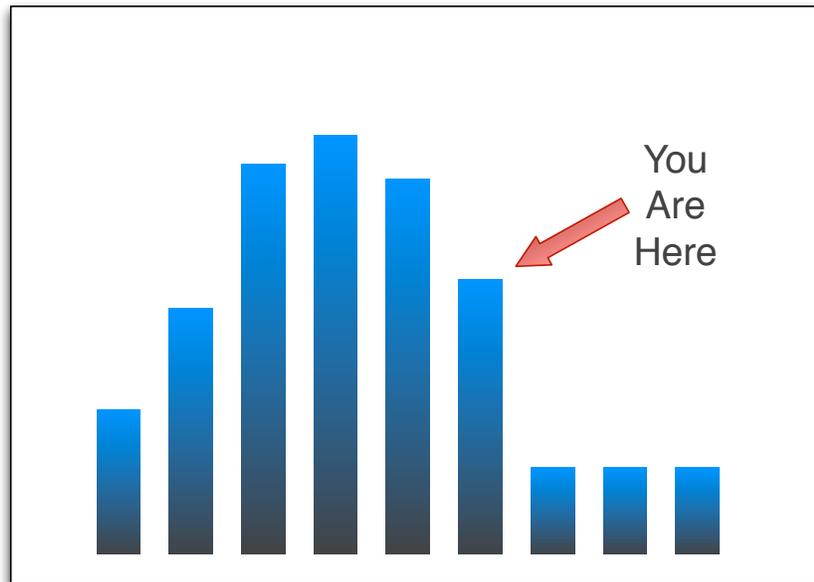


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If the cloud of finance problems is not troublesome enough, the threat of the end of film creates even more worry. Fujifilm shipped its last film print stock for 35mm motion picture film in March of this year [March 2013]. AGFA is no longer considered a viable player in this business. That leaves Kodak as the sole supplier of film print stock, who entered into bankruptcy protection early last year, and is finally on a path to exit bankruptcy protection in the coming month. Kodak successfully auctioned its patent portfolio last December [December 2012], but fell short of raising the money needed, resulting in the selloff of more assets. This further clouds the future of film print stock, and there is concern that the climbing cost of film print stock will force studios to cut off film early.

The Sales Cliff

SALES



If you're a manufacturer, you just experienced the best years of sales since the rollout of digital cinema began. That's the good news. The bad news is that you just experienced your best years of cinema sales, ever. The cinema industry has never seen a rollout of new technology of this magnitude in both quantity and investment over such a short span in its 100 year history. We've had a few magnificent years of sales of 30,000 systems per year, and the pace is now beginning to slow. If we assume a conversion market of 125,000 screens, and model 5% attrition, then the number of screens to be converted is about 119,000. That leaves 15,000 screens left to convert, after which sales will reduce to support only new cinema construction. This slump is expected to continue throughout this decade. This is not cheery news for manufacturers.

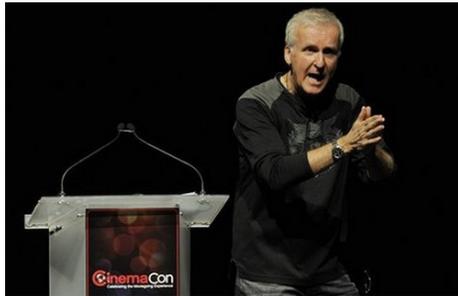


Four Phases of Buying

If you're a manufacturer and looking ahead to comparatively bleak sales, then it's time to re-evaluate your product lineup. The customer buying pattern can be described by The Four Phases of Buying shown in the chart. As the focus of the market moves down the list, margins also go down. This list maps nicely to the technology adoption curve. Early adopters are most interested in functionality, at the top of the list. They have little concern for reliability, convenience, and price, which is why this phase has high margins. When selling in a late adopter market, which is where the market is today, products have become commodities, and all that the customer cares about is price. Every manufacturer today will confirm that they are in a bloody price war.

To get out of this, it would be ideal to refocus the market on functionality, where the margins are high. No doubt you've been given the pitch.

Higher Frame Rates



Laser Illumination



Ready To
Buy More?

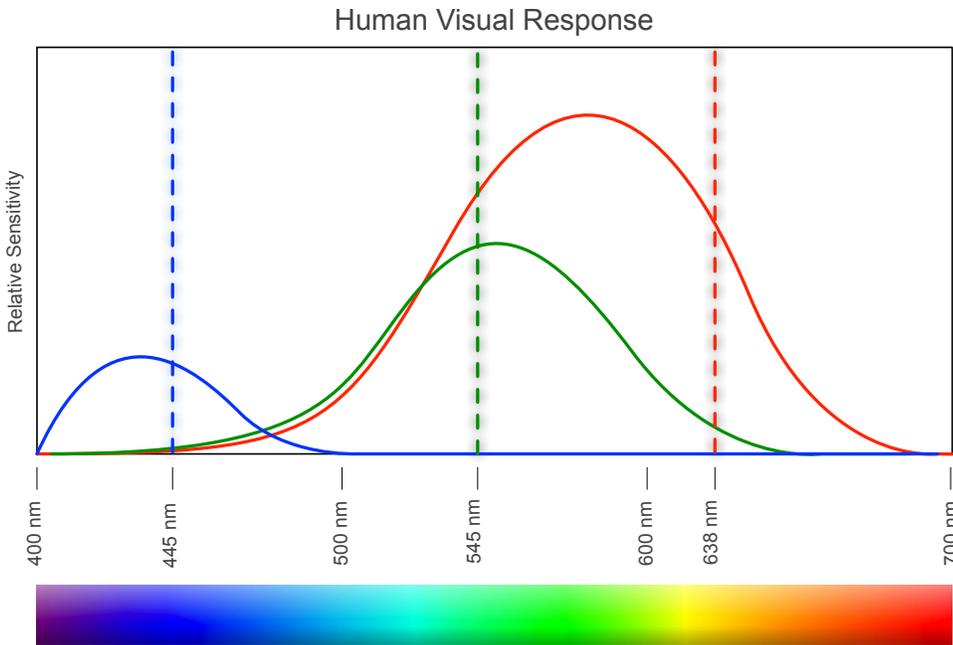
 DOLBY.ATMOS

 AURO^{3D}

Immersive Sound

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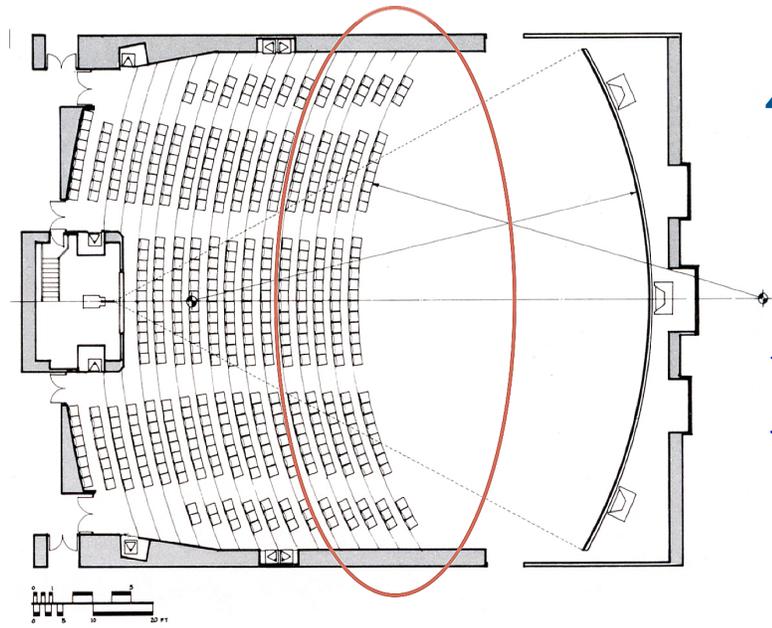
It's no coincidence that manufacturers like to talk about higher frame rates, laser illuminated projectors, and immersive sound. Likewise, creative forces like to experiment with new technology. Directors, like exhibitors, are interested in differentiating the cinema experience from the home. But are you ready to buy more?



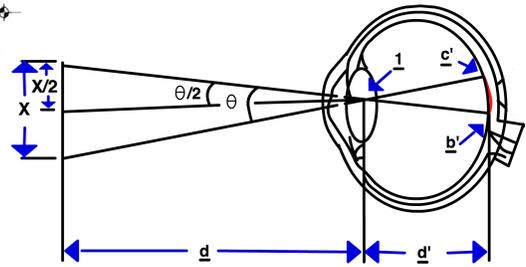
Laser Metamerism

I'm going to dive into two new technologies, just to highlight some of the challenges. Laser illumination holds a lot of promise for brighter screens, but it still has some problems to address. Metamerism is one of those. Metamerism is an effect where different people will see color differently when viewing the same projected image. The graph shows the sensitivity of the human eye for red, green, and blue primaries. The filters for red, green, and blue in a digital projector provide a broad spectrum per primary when xenon lamps are used. In contrast, laser projector primaries are quite narrow, as shown by the dashed lines. The wider spectrum resulting from xenon lamps is averaged across a large population. As a result, we each tend to see the same colors. But the narrowness in spectrum for laser primaries results in metamerism. This results in a situation where a large population will not see colors in an identical manner. Laser proponents say this is solvable. The next step is to convince cinematographers that the solutions work.

4K and UHDTV

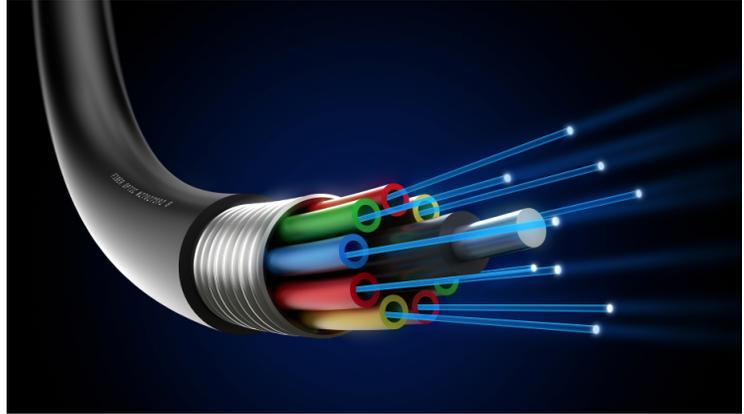


4K Sweet Spot



Another area of technology to discuss is UHDTV. UHDTV is entering the home entertainment market, making consumers aware of 4K resolution. Only about 20% of cinemas in the world are capable of 4K projection, and exhibitors need to know if this is a problem. 4K may one day deliver high value to mainstream cinema, but in my view, that day is not today. When showing static images, your audiences are unlikely to value 4K, because in most cinemas, it's not possible to get the benefit of 4K from the highly valued seats in the middle of the auditorium. The human eye can only resolve so much. Where 4K could have benefit in the future is with the faster motion possible with higher frame rates. There are structural limitations in digital cinema technology that prevent current day projection systems from supporting the combination of higher frame rates and higher resolution, regardless of the resolution of the projector. Higher frame rates combined with 4K could become the cornerstone for a future Digital Cinema 2.0.

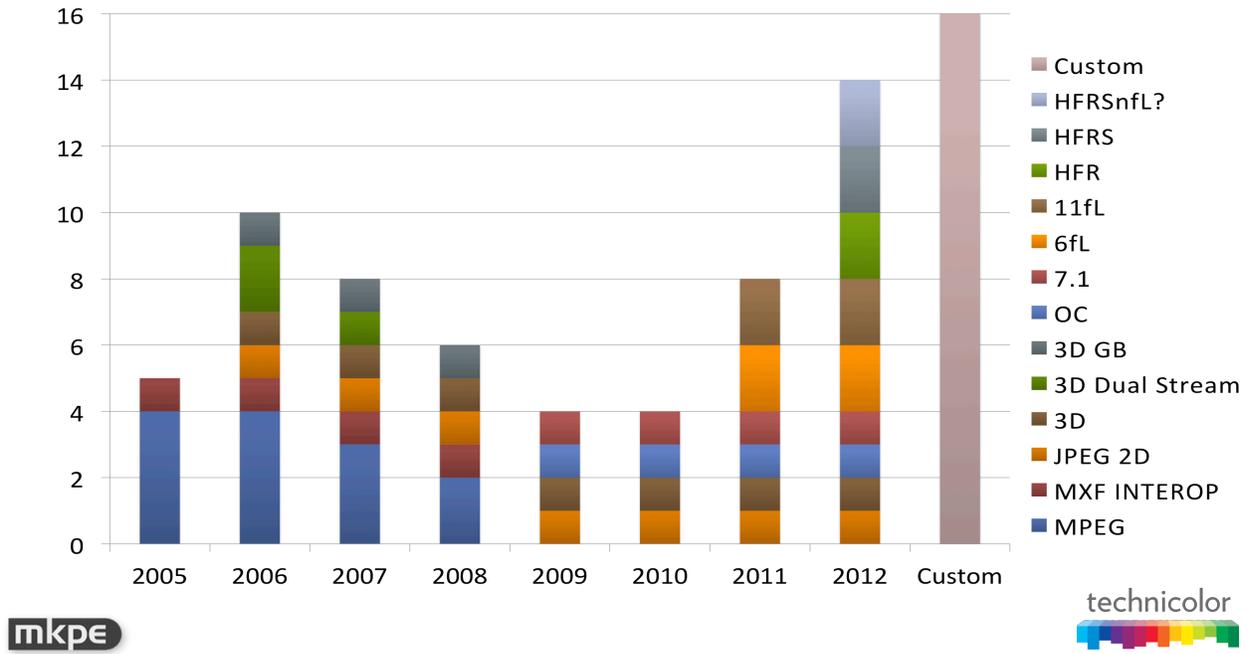
The Real Opportunity: Efficiency



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Where real demand exists, however, is in making it more efficient to operate the cinemas that have spent €4.3B in new equipment worldwide. Digital cinema is still new technology, and the workflows required to distribute content and keys, and play movies, has a very long way to go before we can say that the industry has achieved optimization. You will see this in the several companies now vying to build out satellite and network-based file distribution methods. There are no standards in this part of the business, so the game that's afoot is to build market share by convincing you to install their systems in your cinemas.

The Content Management Problem



Distributors have been faced with the problem of multiple versions of digital content for many years. For a few years it appeared that the problem was under control. But this is no longer the case. The variety of versions that must be supported are growing, as shown in this graph by Technicolor.

DCI Digital Cinema Initiatives, LLC

A Few Words...



We just reviewed the several areas where there is tension in the business. In those areas where technology is a little wild, there are organizations that could step in to help. DCI is a consortium of the six major Hollywood studios that issues specifications and recommendations. It does not produce standards. Digital cinema equipment today is tested to the DCI Digital Cinema System Specification, which is unlikely to change in a significant way. Where guidance is needed for new technologies, DCI issues recommendations and posts these on its web site at <http://dcimovies.com>. SMPTE is the Society of Motion Picture and Television Engineers, which is the core body where digital cinema standards are developed. Standards are useful for specifying ways to achieve interoperability among competitors, and in doing so, creating a bigger market for themselves. For example, SMPTE today is working on standards for 3D Subtitling, formalizing the production and packaging of higher frame rates in digital cinema distribution, and exploring new methods for aligning cinema sound systems. Many SMPTE standards are submitted to ISO for international standardization. The Inter Society Digital Cinema Forum, or ISDCF, is often thought of as the “therapy group” for digital cinema. Manufacturers, Distributors, and Exhibitors attend these meetings to discuss their problems. ISDCF does not produce specifications or standards, but sometimes it will produce a recommendation. ISDCF has spent the past few years evaluating the readiness of digital cinema equipment for a transition to SMPTE-standardized digital cinema distributions packages, which you know as DCPs.

In Summary...

The end of film is near, because sellers will no longer be able to afford it.

DCI will not change, but cinema technology will, because directors like to experiment, and sellers want to sell you more.

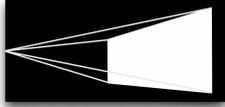
New technology standards are needed to improve the efficiency of cinema operations, because that's what buyers need.



I just covered a lot of ground about the state of the technology side of the cinema industry. If I were to leave you with three points, it is these:

- * The end of film is near.
- * Technology will change, but DCI won't. New technology will be driven by creative forces, not distributors.
- * Standards would greatly benefit the ability of distributors and exhibitors to operate more efficiently. But neither distributors nor exhibitors are thinking about standards today.

CINEMA D'EUROPA



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