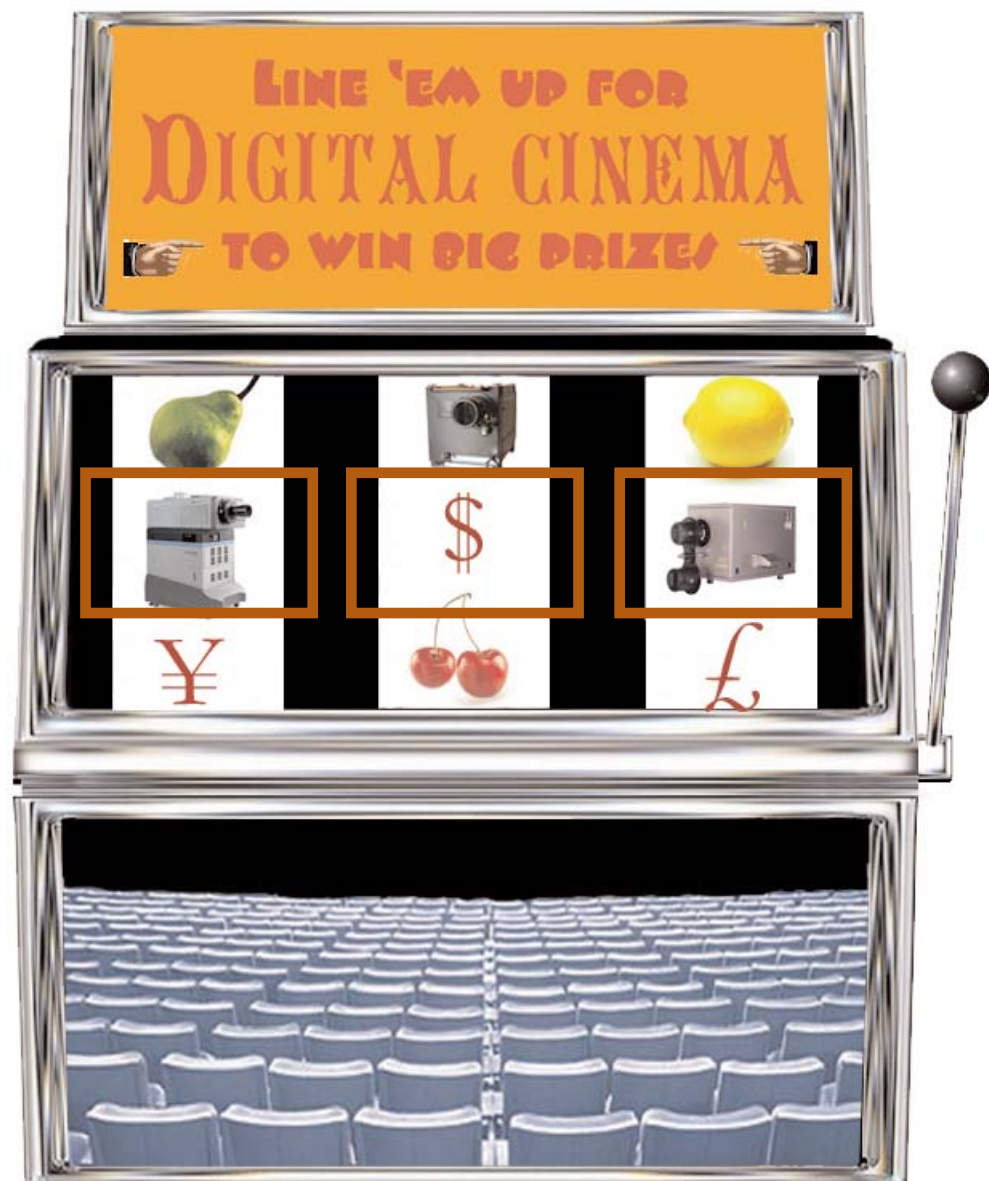


Digital Cinema Business Models

The global outlook



**Digital Cinema Business Models:
The global outlook**

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56	Ultra-wide releases
56	● Windows and release patterns
57	● Piracy and import levels
57	● Diminishing role of cinema
57	● Various cost savings
58	● The many lives and profits of film
61	● Conclusion

5 Film content

63	● Digital chicken-or-egg
64	● Terminology
64	● Cost of mastering
	● Different types of origination
65	Animation—CG
65	Animation—cell
66	Digital video—high end
67	Digital video—low end
67	35mm film
68	Digital intermediate
69	● Digital as cost saver
69	● Growth of orphan titles
69	● Digital cinema for re-release
70	● Geographical differences
70	● Support of creatives
71	● Conclusion

6 Studio report card

73	● Hollywood
74	Disney/Buena Vista
76	Warner Bros
79	Sony Pictures
80	Universal
82	Twentieth Century-Fox

84	Miramax
85	MGM
87	Dreamworks SKG
88	Paramount
89	New Line Cinema
	● Other
90	Europe
92	Asia-Pacific
93	Latin America
94	Other/independents

7 Exhibitors

97	● Geographical divisions
101	North America
105	Europe
107	Latin America
109	Asia-Pacific
111	● Post-production

8 Third-party players

113	● Overview
114	● The proposition
115	● Film business companies
115	Technicolor
118	Kodak
121	● Industry insider companies
121	Digital Cinema Initiatives
123	Digital Projection Partners
125	● Telecom and satellite integrator companies
125	Boeing
128	Elsacom/E-Screen
130	NTT

132 ● Alternative networks
 133 Digital Cinema Solutions
 134 Folkets Hus/Digitala Hus
 136 ● Other companies
 136 GDC
 138 Pixnet
 139 TeleImage
 142 T-Joy
 143 ● Conclusion

9 Advertising

145 ● Overview
 146 Analogue limitations
 146 Digital proposition
 146 Arguments against digital
 147 ● Standards—SD or HD?
 147 ● Business case
 Theory
 Reality
 148 ● US-Europe differences
 149 ● The digital Trojan horse
 ● Profiles
 150 BREAK
 151 CECIS
 ● Cinema advertisers
 152 CAPA
 156 Carlton Screen Advertising (CSA)
 158 Cinemark
 161 National Cinema Network (NCN)
 163 Pearl & Dean Cinemas
 164 Regal CineMedia
 167 ScreenVision US & Europe
 171 Val Morgan

173 Others
 Digireel
 Kodak
 Microsoft-BMW
 Ovation Interactive

10 Alternative content

175 ● Introduction
 176 ● Alternative content vs. alternative use
 176 ● Technology
 High definition (HD)
 Standard definition (SD)
 Other issues
 Conclusion
 177 ● Glossary
 178 ● Charging
 Direct ticketing
 Indirect—concessions
 Sponsorship/promotions
 Rental
 Members/passes
 Micro-payments
 183 ● Attitudes
 Sport
 Stage
 Music
 Games
 Television
 Education
 Business
 Religious
 Other
 Summary

187	● Profiles	194	● Alternative use
197	Arenaplex	194	Gaming/interactive
187	BTN—Broadway Television Network	195	Education
188	CCDE—Closed Circuit Digital Events	195	Corporate
188	ESports Arena	196	● Conclusion
188	TVN Entertainment		
188	WorldStage/InTheater Entertainment		
189	● Exhibitors	197	11 Alternative venue operators
189	UCI		
190	Emagine Entertainment		● Profiles
190	Galaxy Cinemas	198	Past ‘failures’
190	Famous Players	199	Largo DMN
190	Regal CineMedia	200	Network Event Theaters
191	● Categories	202	Current ventures
191	Sport	202	CineMuse
191	Football	203	Cinetransformer
192	Extreme sports	205	Emerging Cinemas
192	Other sports	206	Enterprise Broadcasting Corporation
192	PPV sports	207	Immersion Studios
192	Music	208	VTHR
193	Pop/rock		
193	Classical		
193	Musical/stage	211	12 Conclusion, outlook and forecast
194	Television		

List of tables and charts

	2 A brief history of the cinema			5 Film content
18	Cinema admissions 1930-1960	63	Digital cinema titles released worldwide	
23	Studios breakdown of revenues from film distribution (I)	64	Origination of digital film releases	
23	Studios breakdown of revenues from film distribution (II)	65	Digital releases of CG films	
	3 Technology	65	Digital releases of cell animation films	
28	Quality fall-off in 35mm film process	66	Digital releases of high-end digital video	
28	Television formats	67	Digital releases of 35mm film	
29	Film formats	68	Selected digital intermediate (DI) releases on 35mm prints	
29	PC display formats	70	Digital releases by country of origin	
30	Digital Cinema Distribution Master (DCDM) formats			6 Studio report card
38	DLP Cinema projector market share	73	Digital production scorecard	
	4 Film print savings	74	Disney	
53	Average film print cost per MPAA film		digital film releases	
53	Average film print and advertising (P&A) cost per MPAA member film	76	releases year-on-year	
54	Number of prints for initial European releases 1998		releases by origination	
54	European film print cost range	76	Warner Bros	
55	Number of prints for initial European releases 2000		digital film releases	
56	Ultra-wide releases (3,000+ screens)		releases year-on-year	
58	Trends in MPAA cost per film 1990-2002	79	releases by origination	
58	Film revenue by sector		Sony Pictures	
59	International film revenue by source 2001	79	digital film releases	
59	DVD households worldwide		releases year-on-year	
59	Video software sales and rentals worldwide	80	releases by origination	
60	US cinema and video openings compared		Universal Studios	
60	US box office openings 2001,2002	80	digital film releases	
			releases year-on-year	
			releases by origination	
		82	Twentieth Century-Fox	
			digital film releases	
			releases year-on-year	
			releases by origination	

84	Miramax Films	126	Boeing Digital Cinema installations US and UK
	digital film releases		
	releases year-on-year	129	Elsacom Orpheus geographical coverage
	releases by origination	134	DCS digital cinema installations
85	MGM digital	135	Folkets Hus revenue comparison
	digital film releases	139	TeleImage milestones
	releases year-on-year	140	TeleImage installations in Brazil
	releases by origination	141	TeleImage content output 2001-2002
87	Dreamworks SKG		
	digital film releases		
	releases year-on-year		
	releases by origination		
91	Folkets Hus & Parker digital releases		
92	Asia-Pacific digital releases		
94	Latin American digital releases		
95-96	Complete list of digital film releases		
	7 Exhibitors		
97	Commercial digital screens worldwide by region		
98	Commercial digital screens worldwide by country		
98	Digital cinema screen growth year-on-year		
99	Commercial digital screens worldwide by operator		
99	Digital cinema titles released by half-year		
99	Digital releases by country of origin		
100	North American digital cinema locations		
101	Digital cinema sites and screens by US state		
101	US: Digital cinema installations by investor		
103	US: Digital cinema installations by exhibitor		
104	European digital cinema locations		
105	Europe: Digital cinema by country		
105	European digital cinema screens by operator		
106	Latin American digital cinema locations		
107	Latin America: Digital cinemas by country		
108	Asia-Pacific digital cinema locations		
109	Asia-Pacific: Digital cinemas by country		
109	Japan: Digital cinemas by operator		
	Post-production digital projection facilities		
	8 Third-party players		
116	Technicolor Digital Cinema installations US and UK		
122	DCI members		
125	Telco digital cinema players		
			9 Advertising
		145	AMC Entertainment financial summary
		149	Summary of digital advertising activity
		154	CAPA first quarter revenue
		155	Changes in television and cinema advertising 2002 in Norway
		155	CAPA quarter gains in bookings 2002
		159	Cinemark installations
		160	Current list of Cinemark digital advertising sites
		171	Val Morgan digital sites
		172	Val Morgan digital research findings
			10 Alternative content
		180	Alternative content and alternative use
			Exhibitor attitudes
		183	Sport as alternative content
		183	Stage as alternative content
		184	Music as alternative content
		184	Games as alternative content
		184	Television as alternative content
		185	Education as alternative content
		185	Business as alternative content
		185	Religion as alternative content
		186	Other as alternative content
		186	Aggregate views—alternative content
			11 Alternative venue operators
		200	Network Event Theaters digital screening events
		201	NET screenings by type 1995-2001
		204	Cinetransformer technical specification
		209	A look at VTHR's recent programmes
			12 Conclusion and outlook
		211	The 'Olin curve' of d-cinema growth
		212	Digital screens worldwide forecast

3

Technology

Introduction

This chapter deals with digital cinema technology and associated standards from an investment perspective. As such, it is not an examination of the various hardware and software solutions, manufacturers and proponents *per se*. A comprehensive overview of both technology and players was provided in the Screen Digest report *Electronic Cinema: the Big Screen Goes Digital*.

The aim is to explore which technologies provide solutions today, what their long-term viability is, how they are expected to evolve and whether they meet current and future digital cinema standards. Profiles of each of the significant hardware manufacturers and solutions providers explain what their role is and—above all—how they hope to make money from the large-scale switch to digital in cinemas.

It is worth reiterating that the small size of the cinema market does not bear out the large past and present level of interest and attention from various actual and would-be digital cinema players.

There is currently a total global market of between approximately 100,000 and 125,000 first run cinema screens. Even if the introduction of digital grows this market by 10 to 20 per cent, this would still only create a total target market of 150,000 screens in fewer than 100,000 cinemas, due to growing number of multiplexes.

Given the small size of the potential digital cinema market, there is insufficient return to justify developing technologies (and standards) uniquely for the exhibition market. What hardware and software solutions there are must thus either be re-purposed from a different but

associated field, usually the broadcast, telecom or visual display markets, or have the potential to be re-applied to a another larger field, particularly the consumer electronics (CE) market. This must be kept in mind when examining the motives the new digital cinema hardware and service vendors.

Historical investment

For over 100 years cinema owners have themselves been the exclusive investors, owners and maintainers of all film projection, synchronised sound, cinema automation and associated technologies to be found in the projection booth. What is more, this technology has historically tended to have very little incompatibility or built-in redundancy. Both projectionists and manufacturers claim that a well maintained 35mm projector can last 20-30 years, if not indefinitely.

Projectors have traditionally come from one of three major manufacturers, Italy's **Cinemacconica**, Germany's **Kinoton** or America's **Christie**, a division of the Japanese major **Ushio**. These provide projectors, platters, associated equipment, as well as detailed after-service and customer support. All three have good industry reputation and particular regional and customer strengths. There have not been any significant new entrants in this market, not least because there is a significant market in the developing world for used projectors.

Whilst exhibitors have been faced with new investments, none have been for wholesale replacement of existing technology and infrastructure in the projection booth. The most

significant (discussed in detail in Chapter 2) was the launch of synchronised sound-on-film in the late 1920s and early 1930s. This did not so much lead to changes in existing cinemas as a wholesale change of the cinema marketplace with the closure of smaller screening venues and the birth of 1,000+ seat picture palaces.

Cinemas were thus purpose built to accommodate and support the new technology rather than retro-fitted. [In a neat historical irony, the first major purpose-built 'talking pictures' theatre to be constructed in the US in the 1920, the Pacific Theater on Hollywood Boulevard in Los Angeles, is currently the home of the ETC's and DCI's digital cinema standard efforts. The theatre is said to be haunted by the ghost of Samuel Warner for its not having been completed in time to premiere the first talkie, *The Jazz Singer* (1928).]

The installation of digital audio was relatively simple and cheap—at least compared with digital cinema. Perhaps the most significant recent investment by exhibitors was the switch to horizontal platters for film that replaced the vertical reels.

Redundancy

Mechanical projectors have little or no redundancy. This is because if we disregard 70mm and Imax film, there are no regular improvements to 35mm film that affect the projectors. Though the grain of the raw stock is constantly evolved, this does not require any changes to the projector itself. All the resolution is built into the medium rather than the mechanism for displaying it, which only needs a strong light source. This means that well-maintained 35mm projectors can in theory last at least as long as there are spare parts.

The introduction of digital cinema projectors places exhibitors in a position they are not accustomed to, albeit one familiar to most other industries: how to deal with redundant equipment. The main fear for exhibitors is that they will be forced to adopt more than one proprietary standard and that equipment may prove incompatible and not scalable. The redundancy issue is thus not foremost on exhibitors' minds, but it is nonetheless a factor.

Digital cinema projectors have most of the advantages of the famous Moore's Law (see box) in that an improved model will be created every one or two years, but prices are unlikely to fall as much as they do for PCs, given that a large part of digital projectors is made up of complicated optics that do not have significant economies of scale.

Moore's Law states that the amount of processing power on a given amount of silicon has roughly doubled every 18 months since the technology was invented and will continue to do so for the foreseeable future. This means that computers effectively double in speed or halve in price every year and a half.

There is little that can be done about this. Most other companies have learned to adapt to this. Not all firms replace their computers every 18 months, but even car companies tend to upgrade to newer models every four to six years. The cinema industry will need to look to the film post-production industry, where similar changes have taken place in the switch from physical to digital film handling.

Standards

Myth of a uniform 35mm standard

Much of the discussion about standards stems from the desire to create something as universal as lasting as the existing cinema systems. The universality of the existing 35mm standard is, however, a truth with important modification. The claim that the same reel of film can be played in any cinema from Brighton to Bangkok needs to be qualified to better appreciate the task facing those working in various digital cinema standards bodies.

Film prints on 35mm film can accommodate a range of standards:

- 35mm film supports both colour and black and white film
- 35mm film accommodates Academy aspect ratio (1.33: 1) as well as various types of widescreen (1.85:1, 2.35:1 and various other format in between).
- 35mm prints can hold an analogue mono or stereo audio track, as well as Dolby Digital or SDDS digital audio track (DTS is shipped separately on a disk).
- 35mm can be played at various frame rates.

Though it is traditionally always projected at 24 frames per second (fps), film technologies such as Showscan and Imax increase the frame rate.

The different standards above necessitate different lenses or different audio decoding equipment. It is true to say, however, that digital cinema threatens to create an even more numerous set of different and incompatible standards. It is this that is causing doubt and uncertainty about digital cinema investment.

8

Third-party players

Technicolor
Kodak
Dolby
Digital Projection
Partners
Digital Cinema
Initiatives
Boeing
Elsacom/E-Screen
NTT
Digital Cinema
Solutions
Folkets Hus/Digitala
Hus
GDC
Pixnet
TeleImage
T-Joy

Overview

The digital cinema market has attracted a lot of interest from outside parties seeing a role for a new business entity and proposition bridging the gap between distributors and exhibitors, as well as between cinemas and new content providers. These companies also include established cinema players who are trying to redefine their role to meet the challenge of the digital future that threatens to undermine their traditional business model.

There was initially a great deal of hope that such third-party players would act as enablers in solving the dilemma of how to fund hardware installations in the face of deadlock over how to share the cost and savings resulting from the elimination of film prints. Yet these companies have not fully overcome the fear and mistrust of both the studios and exhibitors in trying to establish a business in the small space separating cinemas and studios where currently only a thin strip of film exists.

Third-party players have, however, begun deploying in very small numbers and while there have been a lot of false starts and dashed initial hopes, it is too early to write off this group of companies altogether. We will hence profile the significant players in this space and examine their chance of success, as well as considering the market conditions for outside parties to create a viable business in the digital cinema sphere.

The most important player to-date has been **Technicolor Digital Cinema (TDC)**, which set out in early 2001 with grand ambitions that have subsequently have had to be scaled down. It is a company whose current business is film-centred on the exhibition side, and it is thus

trying to remain in the business by embracing digital early on. This is similar to **Kodak Digital Cinema**, although Kodak has not made an aggressive early move into the market, primarily because it has been held back by technology development constraints.

The largest new entrant in the digital cinema field having no background or historical association with the film or cinema industry is Boeing, whose **Boeing Digital Cinema (BDC)** unit has also made small early deployments in the US and UK. Despite the very small network of screens, Boeing is still the second largest deployer of digital cinema today after Technicolor.

The digital cinema field had in the past attracted a lot of attention from the telecoms sector, which saw it as a way to increase traffic and offer new services to a previously unexploited market. The telecom companies initially involved in the digital cinema field have largely withdrawn, due to the collapse of the telecoms sector in the last few years. However, there are still some companies such as **Elsacom** that are pursuing business in this field.

Some of the smaller entrants in the third-party market have been companies with some historical film or cinema connections that are trying to expand their role or find new markets. These include the likes of Canadian advertising and art-house based **Pixnet** and Brazilian post-production company **TeleImage**. There is also the consortium approach adopted by the likes of Japan's **T-Joy**. There are semi-alternative or indie networks that deploy lower-end technology solutions for projectors and servers, such as **Digital Cinema Solutions** and **Folkets Hus**.

The proposition

The proposition made by third-party players appears simple on the surface. Distributors (read: Hollywood studios) and exhibitors cannot agree amongst themselves who should pay for the digital cinema equipment and who should get the savings from not having to make and distribute 35mm film prints as well as providing additional benefits.

The proposition breaks into four component parts:

- **Cost.** The third-party player pays the upfront hardware and installation cost for digital projectors and associated equipment
- **Control.** The third-party player ensures that there is no shift in the balance of power between distributors and exhibitors resulting from the switch to digital.
- **Added value.** The third-party player offers added value for both the distributor, in the form of greater security and transparency, and the exhibitor, by enabling new forms of content and use.
- **End-to-end integration.** The third-party company takes care of every aspect of handling the digital film, from making the digital master, delivering it to the cinema, ensuring the enforcement of the DRM (digital rights management) and servicing.

In return the third-party player expects to get a return on investment by getting a fee from the distributor and the exhibitor. This fee can be based on a number of different variables, depending on how the proposition is structured.

- **Per-print fee.** The pricing is based on the number of digital copies distributed, which would be equivalent to the number of 35mm copies saved. A proportion of the per-print savings would be charged by the third party. This charge is to distributors only.
- **Per-screening fee.** This would be a flat fee for each time that the digital copy is played in any theatre. The fee would be the same regardless of how many tickets were sold. This fee could be charged to both distributors and exhibitors.
- **Per-ticket fee.** This is a charge out of the revenue of each ticket sold to a digital screening. This fee would take into account rental fees between distributors and exhibitors, though it could also be seen as a 'digital tax'. This fee would come from both distributors and exhibitors, depending on the rental fee.
- **Annual contract.** This would apply to fixed and pre-agreed numbers of films and screenings that the third party is contracted to undertake. There could be some variations built into such a pricing structure, although it is effectively a digital bulk

contract. This would primarily be charged to distributors.

- **Per-special event/ticket fee.** This would be a special charge for the use of the equipment for content other than film. This charge would be applied to exhibitors or sponsors only.

Both of the third-party players to have rolled out commercially to date (Boeing and Technicolor) have adopted a combination of the above charge mechanisms. Neither company has chosen to make public the details of its business proposition, following Technicolor's first business strategic re-think. In launching, however, they have had to offer exceedingly aggressive terms to try to sway potential customers, and even then with only modest success.

Other players have had more success by targeting niche markets or territories. Only two of them have anything approaching a significant roll-out Japan's T-Joy and Brazil's TeleImage. Both have adopted a distinctly different approach from that outlined above; both will be examined in the profile for each company.

Alternative content

This section provides an overview of the market for alternative content and use in cinemas, primarily focusing on business issues associated with it. A more in-depth study of all aspects of the alternative content field is provided in the separate *Screen Digest* report *Digital Cinema: Alternative Content*. Whilst this chapter draws on the work and findings of this study, it is by no means meant as a substitute for the full report on this major topic.

Introduction

The digital projection of alternative content—ie, forms of large-screen content other than feature film, represents the greatest new revenue potential for cinema exhibitors. While nothing is likely to challenge the supremacy of film as the primary entertainment proposition in cinemas, alternative content has the potential to become a valuable niche market for exhibitors. Yet even as a cinema niche proposition, the many uncertainties and practical issues surrounding the concept have meant that it is difficult to estimate how much of a revenue generator alternative content can be and also what it will involve to persuade people to come and see sports or concerts in cinemas.

It is clear that alternative content will not by itself support the deployment of a dedicated network in cinemas for the distribution and screening of such material. As such, no business plan that relies primarily or mainly on alternative content has had any success. There are instead concerted moves to use existing digital infrastructure.

In the past, this has been a low-end projector that can be moved between screens in

a multiplex that does not rely on a particular network for its feed. It has often been mooted that alternative content will provide ‘icing on the cake’ in financial terms for cinemas equipped with high-end digital cinema projectors. However, the slow deployment of digital cinema coupled with interface issues for first generation digital cinema projectors has meant that this is only likely to be the case in the future.

In the place of high-end digital cinema projector twin-use, the aim has now become to find expanded use for lower-end, fixed and networked digital projector installations in cinemas. These have overwhelmingly been projectors and networks for pre-show digital advertising in cinemas. As of early 2003, there were more than 2,750 such digital pre-show screens, compared to just 160 digital cinema screens worldwide. Alternative content is thus piggyback riding on digital advertising infrastructure that has paid for itself and is looking for additional revenue. In the case of Regal, its digital network was created from the outset with the twin aims of providing a channel for both advertising and for new forms of revenue generating content, such as alternative content and alternative use.

As digital advertising rolls out on a large scale in 2003, there is thus a network infrastructure in place for alternative content use. This fact, combined with extensive testing of alternative content from both a technology and business perspective over the past five years, means that we are likely to see a serious roll-out of alternative content offering in 2003. This year will primarily be a test for the large-scale ability of cinema networks to handle the display,

Alternative content v. alternative use

As with so much else in the new digital sphere of cinema, it is important to clarify terminology at the outset, as well as establishing and delineating the concepts involved. We will distinguish between two alternatives to film screenings.

Alternative content signifies the replacement of traditional first-run feature film (whether on 35mm or in digital cinema form) with other forms of large-screen entertainment intended for mass public consumption. This will traditionally take place on the same terms as films—ie, mainly screened at evenings and weekends and considered ‘lean back’ entertainment. It does not require the installation or use of additional forms of technology other than the networked digital projector. Events can be ‘live’ (that is, shown in real-time) or pre-recorded and range from sports matches and pop concerts to ballet and television programming.

Alternative use is the utilisation of cinemas in ways that large-screen entertainment (whether film or alternative content) does not appear to have the potential to do. This means using non-prime time—ie, weekday mornings and early afternoons, which are considered ‘down time’ or ‘dark hours’. This involves uses such as staging corporate events, holding education seminars, interactive gaming concepts and even Sunday morning worship telecasts. Such use often involves technology additional to the networked digital projector, primarily some form of return channel and interactive interface.

promotion and monetisation of non-film content in a traditional film environment. While the conclusive proof for alternative content’s viability in cinemas has not yet been established, the exhibition industry is in a better position than ever to at least try it.

Exhibitors have a long tradition of screening feature films and a reasonably good relationship with film distributors, meaning that there is a well-established practice and mechanism for screening and promoting films in cinemas. The replacement of any film screening will therefore only come about because exhibitors firmly believe that it will bring in more money without creating an excessive additional workload. The extra work needed to bring about an alternative content screening, which will further involve replacing a film that would otherwise have been projected in that auditorium and time-slot, means that such changes will not happen easily.

It is thus the under-utilisation of existing ‘bricks and mortars’ rather than the presence of

digital equipment that will act as a catalyst for alternative content: Under-utilisation stems from:

- dark hours during weekday daytime
- evening screenings Monday-Thursday
- under-performing films and screens.

It is important to realise that existing contracts between exhibitors and distributors prevent cinema owners from replacing films at will. This means that alternative content will initially be tried in limited form on smaller screens and typically on Mondays or mid-week and that alternative usage ultimately holds greater appeal than alternative content.

Technology

Whilst it is possible to display it on everything from the high-end digital cinema projectors to low-end LCD e-cinema ones, alternative content will almost exclusively rely on broadcast technology and standards for production.

While it was the case that the first generation of DLP Cinema projectors were unable to accept anything other than a 24P input, later models have been modified by the projector manufacturers to allow more types of content. Barco was the first one out with its Acscar Content Switcher and Router, designed to convert any analogue or digital signal to the DVI digital input of its D-Cine Premiere digital projector head. Other manufacturers have since followed suit and different content input is no longer an issue for the top-end digital cinema projectors.

The focus has instead shifted to what is an acceptable production format for large-screen display of alternative content. This has often boiled down to a fairly simplistic standard definition (SD) versus high definition (HD) content battle. The issue is in fact not that clear cut and there is no one production format best suited to alternative content.

High definition (HD)

High definition is the preferred option for the capture of any alternative content destined for the big screen. It does offer visibly better quality than standard definition. However, there are problems even with HD. Little if any alternative HD content is captured using 1080 @ 24p cameras. This means that the footage is either just 720 vertical lines (720p) or 1080 interlaced lines (1080i). While the latter in theory offers higher resolution, interlacing can show up more on a big display, particularly in fast moving sports. Settling for 720p or de-interlacing means that the resolution will be closer to that of SD.



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