PROJECT REPORT

ICT challenges and opportunities for the film industry - a value chain perspective on digital distribution

Anders Waage Nilsen, Senior Consultant, Dreis AS
Rune Smistad, Project Manager, MediArena Project

1. Introduction

Change is the new constant. We live in times defined by disruptive transformation. Business models, technological possibilities and customer expectations are changing at breathtaking speed. From its beginnings, the film industry has been shaped by, and has constantly had to adapt to technological improvements. But the paradigm shift from analog to digital is deep and fundamental. It is not a shift from one slow-changing system to another, it is a shift from a predictable world to a non-predictable world. The online world is not a world but a state, an unstable state which constantly creates possibilities, while killing others. The future calls for agility of mind, both in content and industry policy. Predictions are becoming increasingly hard to make, and mind-bending innovation is becoming the rule, not the exception.

The film industry is a digital ecosystem. And new distributional mechanisms, changes in technology and altered customer behavior is affecting the dynamics between different parties within this system. In this white paper we try to capture some of the trends and infrastructural preconditions, and see how they affect the process of film making, distribution and end user services. On the basis of this we will suggest some adaptability strategies. The core question is how the individual film makers, network organisations and public sector can take action to optimize the output from the infrastructural conditions, and thus add commercial value, business dynamics and gained distribution.

Increased interoperability and smarter asset management is not in itself value driving, but they are critical preconditions to create values in the near future. In this paper we do not suggest specific new service layers or infrastructure projects, but instead focus on the importance of adapting existing standards and technologies into the production and business models, and using them to enable new artistic and commercial opportunities. We focus on lightweight and scalable measures that can reduce costs and open up new possibilities.

Film used to be a transparent celluloid strip. Now it is a fully digital. In other words a binary file. This shift from a physical to a virtual product has had a deep impact on most creative industries over the last decade. Add into the mix new production technology for film making, the globally connected end user, new devices, the new cloud services, and you have just witnessed a revolution. A turning point. And turning to what? This paper is written to contribute to the dialog around future scenarios and adaptation strategies at the industrial level. We have gathered input from a broad range of sources - from the film, software, hardware, and online media industries. Inspired by the nature of the web, we have created a mash-up of all of these perspectives together, and hopefully been able to make some new insights emerge from the complexity.

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Anders Waage Nilsen, senior consultant, Dreis Consulting
Rune Smistad, project manager, MediArena

2. WHAT DRIVES AND AFFECTS CHANGES IN ONLINE DISTRIBUTION?

We have been accustomed to film as a medium distributed by cinemas, physical copies and curated tv programming. Now, the dynamic nature of the web is creating a changing environment of applications, services and business models. Will the future be subscription-based or ad-revenue? Will it be downloading, streaming? There are, at least at the time of this writing, a number of drivers and dilemmas that shape the unpredictable future.

Interactive and connected TV is becoming the norm
Over the past six years, the adoption of IPTV has increased at a compound annual growth rate of 92.4 per cent (SNL Kagan), and further reports predict a decline in traditional tv consumption. Web-enabled TVs will grow six-fold to 230 million installed units by 2014, according to In-Stat. This is a market characterized by hyper-competition, and hyper-innovation on a service level. Analysts suggest Telcos often provide the spark to ignite consumer interest in multi-screen services, HD and VOD, generating parallel support for investment in next generation broadband networks.

New "gold standards" in home entertainment
Increasingly better production & screening facilities keep pushing the "gold standard" - what sort of technology is included in the devices that reach the mass-market. High-quality enabling is becoming a competition driver for the hardware industry. Just as High Definition was established as the norm, 3D was the next big thing. Screens and monitors are also improving markedly. OLED (Organic Light Emitting Diode) displays promise more vivid colors, faster response times, while 4K is a type of display resolution that has four times the pixel density of 1080p HDTVs, the current gold standard for mass market high-definition displays. For the film industry, this opens new possibilities. The obvious one is a quality-differentiated approach to business modelling.

The market is increasingly requesting pull over push.
Over the last decade services such as Netflix, Amazon and iTunes have created a new a la carte market. This is deeply disruptive for the cable operators and the t.v operators and their traditional model based on subscriber fees and revenue through advertising. It also changes customer behavior and opens up a market characterized by fast innovation and a wider range of players - including telcos. For the film makers there is a whole new range of distributional possibilities and dilemmas. Approaches range from tight vertical partnerships to wide open distribution based on a Do-It-Yourself approach.

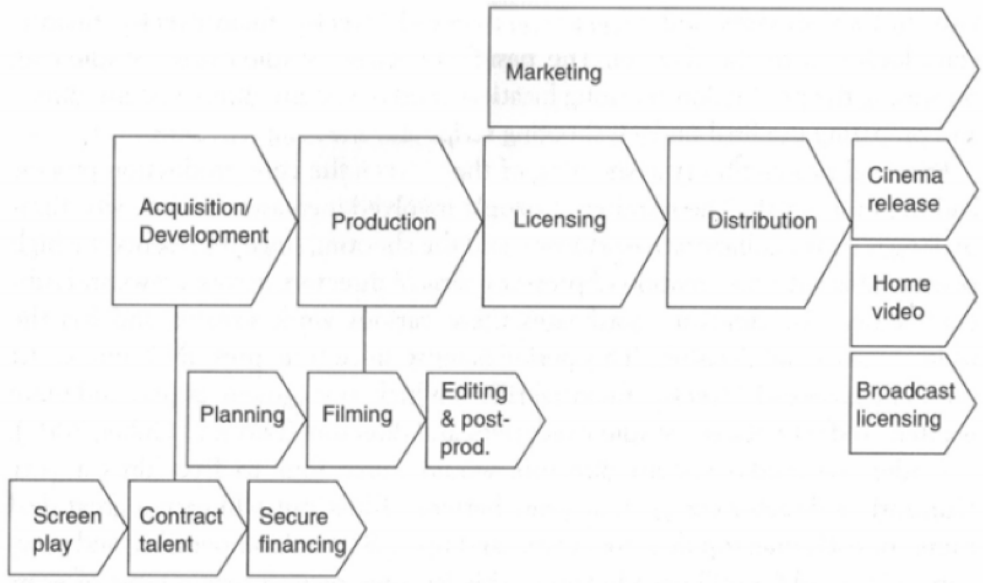
Focus on the environmental impact of online streaming
Each year, the world's data centers use more energy than the airline industry. The carbon emission connected to storage and processing of data is considerable - and gaining attention. Energy efficient storage and processing services that use renewable energy will reduce the carbon footprint. This situation is creating a need for environmental considerations within all ICT related business, including the the film industry.

Broader bandwidth - and a possible downloading renaissance
As more distribution goes online in the form of streaming, the needs of broadband infrastructure increases. Higher quality expectations and new high-end standards is increasing the need for capacity. To take just one example, the current 3D requires twice the bandwidth of HD. Some of our sources find that the combined effect of business models, distribution, file formats and the accessibility of these

devices to people in their own homes, may create a renaissance for downloading and local files. This may also be fuelled by the fact that storage technology is becoming exponentially cheaper as this technology improves.

Cloud services change business (and culture)
In the digital ecosystem, there is generally a shift towards an as-needed, pay-per-use business model, fueled by the emergence of highly scalable and flexible services on the web. For the film industry, the importance is not the the technological innovation, but how the pay-as-you-go, service-based nature of the cloud changes both the models and the culture for doing business. The low cost for low use-principle is creating a more start up-friendly climate, and both service providers and service users (whether consumers or businesses) have roles and perspectives distinctly different from those in a traditional model.

4. The value chain perspective



Above: Value Chain – The Film Industry: Küng et al. 2008, pg 143; and Küng 2008, pg 71.

Copyright paradigm under pressure

Audiences do not have the same habits as they previously did, and new ways of accessing content affects their willingness to pay for existing services. In addition, the viewing contexts are multiplying and the audience expects a free flow of content between different devices and across platforms. High quality

home entertainment and additional mobile screens create new viewing cultures. The cinema is still an unparalleled screening room, enhanced with digital 3D to create an unique experience in format. But its release date and distribution system is based on another paradigm than that of the internet economy. Home entertainment distribution, being the alternative outlet for film, follows the same principles as the cinema, and the industry is struggling to keep control of content flows entering the homes via laptops, tablets and set top boxes. This poses a direct threat to the traditional value chain, which is structured to optimize value within a controllable content infrastructure. This structure is not easily changed, having a very complex and thorough judicial fundament, deeply rooted in national and international copyright legislation and organisational structures.

With digital production, distribution and consumption, certain parts of the value chain experience new forms of competition as well as unforeseen changes in audience behaviour. The paradigms of production, licensing, and distribution have changed, and it is no longer a given that the industry itself provides the best accessibility and user experience to its content. So the industry is challenged both from the inside, with new ways of producing and managing assets and production flow, as well as from the outside, where the end user has access to new platforms and channels and other ways of accessing the very same content they are trying to sell. At the time of writing, the film industry is struggling to be the best provider of its own content, much as the music industry was 6 years ago. The audience is there, and is willing to pay, but the existing business models are set for another type of marketplace. The game industry has changed the way they sell and distribute games, with internet as the distribution channel, free from borders and different national release dates. In comparison, the t.v consumer has to accept that the next season of his favorite show is accessible on Pirate Bay, but not through official channels where he already has payment options established. A dedicated short film enthusiast has to accept that his favourite film just is not available online or anywhere else because a local distributor has the international rights through standard production finance agreements. And the local distributor has no incentive to experiment with a small scale income that would have to be based on a long tail effect. This, in spite of the fact that the content might be sellable for decades. The existing value chain has good mechanisms for controlling the competition, but lacks mechanisms for creatively exploring new ways of making money.

Business models cracking up

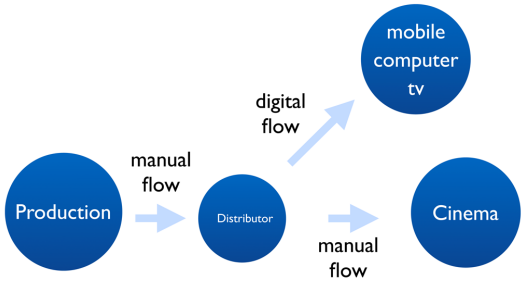
The internet has no borders, and this simple fact challenges the existing income structure of the film value chain with its distribution rights. Torrent technology competes with massive and expensive backbone structures of controlled streaming of content from central service providers. The distributors have to deal with new infrastructure providers, offering new channels for transport of content to the end user. The end user is constantly using new platforms. Consumer electronics and software developers are suddenly taking on the markets at each point in the value chain, as all hardware components are controlled by software, which is what they are best at. iTunes changed the music industry, and is now challenging the film industry. The difference being that within the field of movies and TV, Google, and a series of other competitors are also in a position to get a slice of the same pie. Not because they are good at movies, but because they are good at making user interfaces and working with the content on a metadata level.

Software driven digital technology fragments the existing market power, and redefines the placement of the “cash registers” in the value chain. The film industry needs to adapt to a change oriented way at looking at the value chain, and the end user product, accepting the fact that adaptability and interoperability is crucial for any content provider and distributor. With less control of the value chain, it becomes more important to be able to offer the best tools, and the best ways of distributing, accessing and selling your content, whatever new platform or technology that emerges. If Google or IMDB is how the end user finds your content, well then it has to be sold to him at the first interaction point available. Creating this interaction point is what Google and Apple, and smaller entrepreneurs are good at, thus

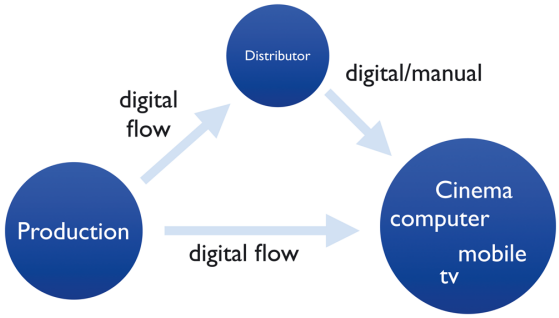
creating new markets and moving and changing the selling points of the existing ones.

It is exciting when a new cultural media revolution is being triggered, and although we are at its forefront we are not quite sure of its impact and can only imagine what it might be. This is what is happening in the film industry.
The questions is not *if*, but *when* we get the movie equivalent of Spotify. As a consumer you would then expect to watch content you have subscribed to, either if it is at the local cinema with 3D glasses, or on your iPad on a plane. Such a level of transparency is not possible within the existing business models or distribution mechanisms of the film industry. There is a lack of interoperability both within content flow and business logic, and it is being challenged by net-based technological and commercial changes, as well as the following changes in audience culture.

State of the digital content flow
Today´s "digital" content flows work separately and differently within different segments of digital entertainment products and film:



Digital cinema - content flow



Tv, games, small film, and online media - content flow

The IP/Cable/Satelite based approach is for the time being the only true digital content flow, using either closed networks or internet for transport. The hard disk approach of the cinema means manual distribution of movie and separate manual distribution of access keys for predefined cinema projectors.

> «Digital distribution of movies hasn't really begun yet», representative from large Scandinavian distributor, September 2011.

The commercial and technological framework has changed in almost every part of the film industry´s value chain. It has moved from static and controllable, to a state of perpetual change and interoperable standards. Adaptability and competence within technology and the ability to identify trends is increasingly important within all parts of the value chain, not only towards the end user. From a distribution point of view, there is no difference between a game and a movie, or a digital cinema or an iPad. They are data files, with metadata telling the system how to understand them, and at the end point, how to read them. This calls for convergence and a different approach to digital content flow, not understood by its traditional understanding of the different media. It also calls for a truly digital approach to the value chain of these digital products.

5. The role of metadata

The film industry does not make film anymore. It makes data. Metadata is the "data about the data". In its simplest form, metadata is handwriting on the back of an old black and white photograph. In a

digital film, metadata is the information we store about the film as a whole, as well as all the segments (along the timeline) and layers within a specific production. Metadata is too often considered something technical , dealing with transmission standards and compression. But with new standards and new technology, metadata opens up what is possibly the most important paradigm shift for the film industry as an ecosystem.

Better workflow
At the *production level*, metadata collection is generated from the equipment used in the actual production process, and narrative details such as scenes, characters etc can be notated according to the needs of the individual production. At the technical level, data about equipment such as lenses, camera settings and crane positions can be recorded. Increasingly, new services also enable automatic analysis of content to fill out additional metadata fields.

Retrieving and re-purposing
At the *content asset management* level, new standards enable richer ways of describing, analyzing and retrieving content (and this even applies to manually stored analog content). Granular tagging of the content backlog enables a new and possibly lucrative long tail market for re-purposing of digital content assets. When metadata is notated along a timeline, small segments will retain individual component status. Material created for one production can be re-purposed for another or be made available for sale or licence.

New distributional mechanisms
At the *distributional and commercial level,* digital rights and terms of use can now be embedded with to actual file, something that enables use by all the players in the delivery and consumption chain. This is being enabled by the MPEG-21 standard, that is set to enable a more open market - creating new dynamics between content creators, producers, distributors and service providers. The standard does technically provide a framework in which any parties can interact with each other over an object - the digital item. It defines the technology needed to support legal exchange, access, consumption, trade or manipulation of digital items in an efficient and transparent way. MPEG-21 also defines a "Rights Expression Language" standard as a means of communicating machine-readable license information and do so in a "ubiquitous, unambiguous and secure" manner.

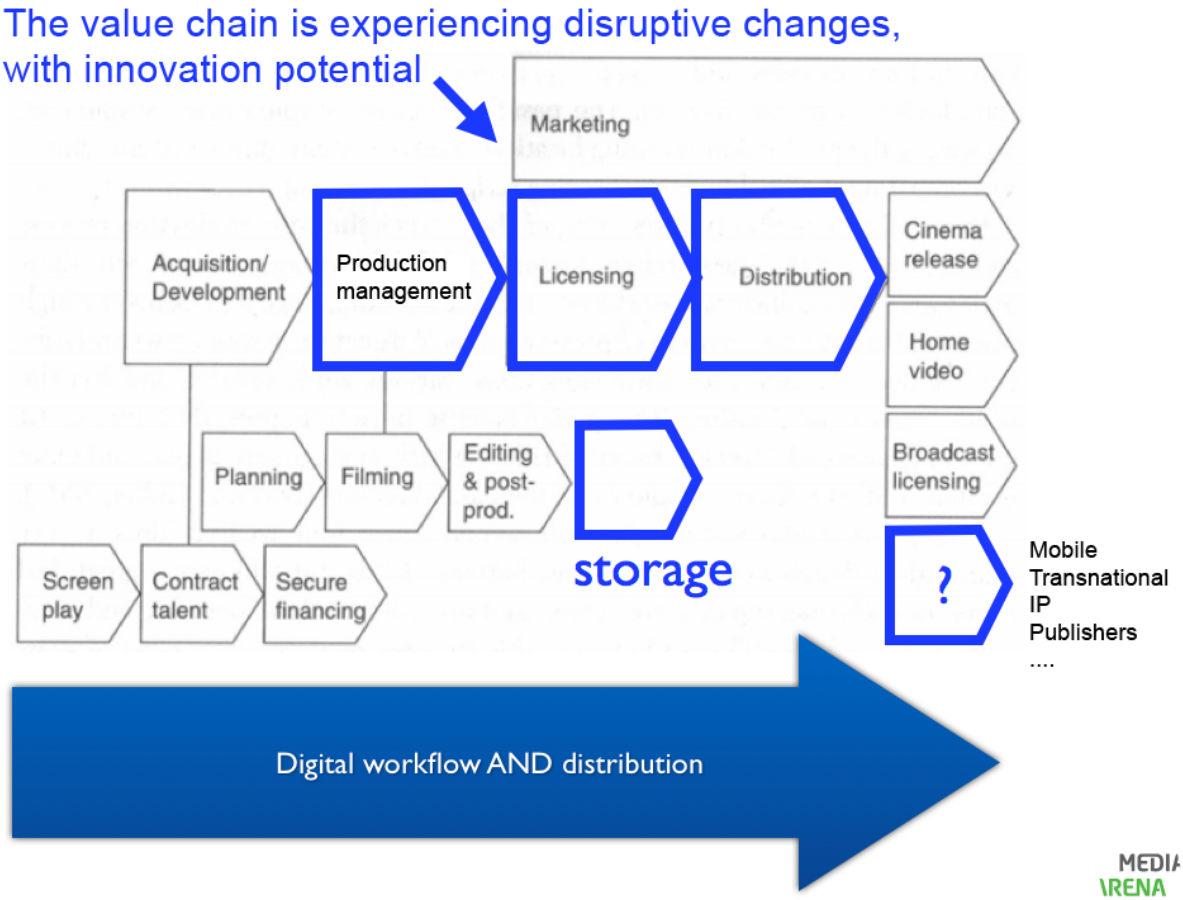
New artistic and commercial possibilites
As metadata technology develops, one can only imagine how this could open new possibilities for manipulating or interacting with the content. UK Strategy Board suggests “substituting characters or branded elements with the users images or avatars that place them within the movie or game”. One may also imagine that a film production distributed on smart devices will carry along with it activation links to other trans-medial resources, such as related games, merchandise offers, soundtrack downloads and additional services. Thus, the film itself will be a vehicle carrying value-adding services, enabling new forms of interaction that can create a richer experience and also added commercial value.

Smart content - increased findability
While our sources believe that cinema distribution will continue within a controlled environment, they find IP-based distribution to be the most important emerging market for content producers. To use contemporary standards as example, an mpeg21-enabled open market model will enable more parties to distribute content for connected tvs, tablets, computers and other devices. Embedded, descriptive metadata will make each individual file “intelligent” from the perspective that it will carry rich information about itself onto the marketplace. This enables new forms of services, including contextual suggestions for the individual end user, and possibly also a more granularized product segmentation for the niche

markets.

6. Challenges for the film industry ecosystem

The printed press, the music industry and film are all having the same experience. The shift from a market of physical objects (papers, records, tapes) to one of digital - thus virtual, convertible and sharable - files, is deeply disruptive. It is not the format in itself that is changing everything, but the fact that the consumer is online, and constantly changing his habits. New fields of business emerge, with new demands for content providers and distributors. Smart new ways of “mashing up content” challenge content providers. The industry’s response to this challenge has been one of defending existing models, not one of building the necessary foundations for new business approaches.



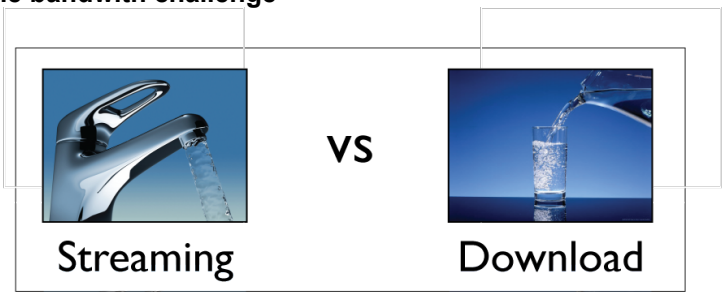
Production & workflow is changing
A challenge at present is the lack of management systems to keep track of and to store the metadata all the way from its conception, through to its production, editing, storage and distribution. Within the industry there is an increasing acknowledgement of the need for tools that retain, manage and organise metadata. To take one example from the UK, the Technology Strategy Board announced an R&D competition to

solve this specific challenge in early 2011. Parts of the toolbox, such as rendering, is set to move to the cloud, and new tools & frameworks for collaborative production etc. is about to change the production climate.

The new dynamism of distribution

Where the past success used to be predictable, future success may come as a surprise. The alternative revenue streams are adding up, becoming more and more important for the overall project.. This calls for a differentiated strategy. “Video on Demand” (VOD) for example. is no longer just ‘one thing’ to hold back or give away; it can span up to a dozen different forms such as Transactional (TVOD), Suscription-based (SVOD,) ad-supported (AVOD), sell-thru (EST/DTO). We are also talking a multitude of different platforms (IPTV, web, mobile, tablets), creating new contexts for film consumption, new viewer habits and thus a new consumer culture embracing the industry.

The bandwith challenge



Paradox:
If we had all the access we wanted to digitally streamed content - the Internet could not deliver enough bandwith

The cost of streaming will force yet another technological rethink. This may be the return of download, but in a green and localized version - not by more enormous, coal-driven data centers placed thousands of miles away from the end-user. The environmental aspect of media distribution is just about to emerge on the global agenda - and may have unforeseen effects on costs, technologies and ethics related to digital infrastructure.

Licensing models in a complex business climate

The film industry has a long tradition of dealing with large up-front expenses, and uncertainty at the income level. Over time this has led to organizational and contractual practices aimed to align risks and prevent conflicts of interest. But this inherited complexity now meets the complexity of a changing infrastructure. The film makers, large studios, distributors, cinemas, TV channels, and now also telcos and other “new” service providers will, and should have different interests in this new business climate, creating a new dynamism in the sector. This new climate of cumulative revenue affects both rights management and licensing models. The right approach, at a business level as well as at a cluster level, could represent a significant compensation for that which is lost from the decline of the old paradigm. Many aspects should be considered such as exclusiveness (how to maximize the effect of small but cumulative revenue streams?), timing (how to maximize value and prolong the afterlife within the plethora of new services?), long tail (how to gain value from re-purposing and yet-to-be-seen services?

), simplicity (could more generic, and potentially machine-readable, license models ease the interaction between many parties within the digital value chain?), the relationship with “middle men” (cost-benefit of “provisional friction” in a connected world).

7. OUR ADVICE

1. Increase industry-wide adaptability
The one thing we are certain about the future is that change will occur at an increasingly rapid rate. This implies that that the film industry should seek adaptability, both at the ecosystem level and within individual businesses. There are many lessons that have been learned from other industries, on how to build infrastructure, shared assets, organisations and incentives that serve as a framework for smartness and agile innovation. This general advice applies to film makers, distribution and service companies, industry networks, funding bodies & policy makers.

2. Focus on the long tail
The film industry should, both from an artistic and cultural commercial perspective, play a more active role in the new services that redefine distribution and revenue streams. We are just seeing how music streaming services create a new culture for exploring music. Musical genre analytics and social sharing algorithms create new suggestion engines that personalize, enrich and expand the musical universe for the individual end user. The long tail of film should be accessible in a similar way. For *feature film* it is essential to establish a more diversified approach to the markets outside and after cinema release. We see the potential in increasing long tail revenue by remodeling the different stages in the lifespan of a production. The after life following the end of cinema should, especially for *independent movies*, be characterized by a wider distributional penetration. *TV content, documentary, video, small features, short film & series* should be managed as valuable digital assets - holding unknown value connected to long tail distribution, re-purposing and yet to-be-seen future innovation.

3. Embrace shared standards and open markets
How does the industry maintain existing revenue streams, while at the same time stimulating innovation at the service level? Simplicity is one possible key factor. Will the increasingly globally-connected film audience accept that release dates and pricing policies change from market to market? Can inevitably complex and online-based commercial infrastructure be handled within a management regime based upon printed documents, contracts with lots of fine print and manual tracking/payment? No. The key in many industries has proven to be shared standards, generic license models & trusted “third parties” that track the digital fingerprints of a fully-digital, dynamic marketplace. The strategy of opening up markets, instead of locking in assets, has proven to be a successful recipe both for value chains and individual business.

4. Digitize the middle man
The role of the middle man in the value chain should be reconsidered as we are entering an era of increased inter-operability (due to new metadata standards) and more sophisticated solutions for storing and distributing online content. Some technologists say we are entering the “API economy”. *API is* an abbreviation of a*pplication program interface* - and they have created an open architecture for sharing content and data between communities and applications. In this way, content that is created in one place can be dynamically posted and updated in multiple locations on the web. It is hard to know how this may change the film industry. But there are most probably costly middlemen in the value chains that could be replaced by source code - increasing the value of created content.

5. Shape the future

The film industry should not wait for the future to happen, but contribute to shaping it. Innovation is partly about answering questions or solving problems. Who asks the questions and defines the problems? The content makers and other stakeholders in the industry should take a more active role - also in creating the shared assets that will be key components in the future content ecosystem. To support standardisation initiatives that enable third parties to enter the value chain, increase dynamics within the industry and enable convergence with other industries. To question the mandate of existing network organisations. To use them as a collaborative framework to develop new shared assets and incentives for standardisation. The film industry should also monitor other content driven industries - especially the music industry. We would suggest openness to be a strategic measure. Not open as in free, but as in inclusive, transparent & adaptable.

6. First steps

Majore feature films

- Focus on infrastructure innovation and research. Learn from the smaller.

Other productions

(tv, documentary, video, small features, short filma, series)

- Focus on metadata and value chain innovation and research within IP-based distribution

Gaming

- Focus on infrastructure innovation and research, and distribution in cooperation with the media industry.

FURTHER READING

Useful tools
http://frameline-47.en.softonic.com/mac

Metadata can express rights and terms of use
http://embeddedmetadata.org/why-metadata-matters.php

Cloud Computings impact on film making
http://technorati.com/technology/cloud-computing/article/cloud-computings-impact-on-film-making/#ixzz1iUZ2hzJH

Digital Video Archives: Managing Through Metadata
http://www.clir.org/pubs/reports/pub106/video.html

Metadata, the future of film making
http://magazine.creativecow.net/article/metadata-the-future-of-filmmaking

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