

Submission to RFP from:

House of Representatives

**Standing Committee on Communications, Information Technology and the Arts**

Submitted by:

**MESA<sup>TM</sup>**  
MEDIA ENTERTAINMENT SYSTEMS ARCHITECTS

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**To:** Standing Committee on Communications, Info. Tech. And the Arts

**Date:** 29-06-03

**Response:**

Inquiry into the Future Opportunities for Australia's Film, Animation, Special Effects and Electronic Game Industries

**From:** Media Entertainment Systems Architects, (MESA) Byron Bay, Australia

**Introduction:**

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MESA is a new international coalition of technologists, information architects, interactive media designers, media producers and educators with an international scope (Australia, NZ, Japan, USA, UK, Germany). MESA's Australian base is located in Byron Bay, NSW. In response to the Committee's RFP, we cannot address all of the committee's questions but answer a few that relate to MESA's core competencies.

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We will address the following inquiries of the committee and offer our solutions to the issues:

- (1) The likely effect of international agreements on the production, distribution and display of Australian films**
  - (2) Introduction of new technologies at current world 'best practice' standards**
  - (3) Educational and training facilities and opportunities**
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- 1. "The likely effect of international agreements on the production, distribution and display of Australian films."**
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## **ONE KEY TO THE FUTURE OF AUSTRALIA'S FILM ECONOMIC VIABILITY (GLOBALLY)**

In our opinion, one of the most influential developments that the Australian film industry should address (pertaining also to the video gaming industry) when planning for sustained growth in the future global economy, is a comprehensive understanding and integrated response to the Hollywood Studio consortium, the Digital Cinema Initiative, (DCI), LLC (see description below) technical and financial specifications and recommended practices addressing the future rollout of the global digital cinema distribution pipeline.

## **WHO IS THE DIGITAL CINEMA INITIATIVE, LLC?**

The 7 major Hollywood studios (Disney, Fox, Sony/Columbia, Viacom/Paramount, Warner Bros., MGM, and Universal) are all founding members of a new company, a rare example of "co-opetition" in action. The DCI's goal is to provide a unifying and cohesive voice to address the challenges of the future of US domestic and international digital film distribution. In 2002 when the DCI was formed, their stated primary goal is to define the technical specifications for the new distribution pipeline and financial mechanisms for accounting for the phase in of a secure, worldwide digital feature film distribution pipelines. It is MESA's opinion that there will be a regional DCI authorized Motion Picture Network Operations Centers in each major region of the world, including Australia and New Zealand.

## **WHEN WILL THE ROLLOUT OF DIGITAL MOVIES DISTRIBUTION CHANNELS OCCUR?**

This rollout effort is estimated to occur over the next 2-10 years. The DCI's efforts will likely be concluded and published within the next 12 months. In our opinion, there will be some delays likely due to internal members debate and politics. We humorously refer to this pending specification due in 2004, as "Vatican

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papal edict". The tipping point will not be reached for large scale conversion of digital systems in theatres until the price point for the equipment reaches approximately \$100,000 per screen average and the resolution of the projectors exceed current digital cinema specs. (see Technical Appendix #2 below)

## COOPERATION BETWEEN COMPETITORS (CO-OPETITION)

This landmark effort is unprecedented within Hollywood's culture and history of fiercely competitive behavior. Hollywood Studios seldom, if ever, agree until now, forced by the many daunting challenges and opportunities of the 21<sup>st</sup> century digital age. Also, the major studios realize it is far more profitable to create a unified specification, rather than each going it alone with competitive and non inter-operable systems. The DCI members vow not to repeat the current situation we witness with enhanced theatrical audio systems which are incompatible with each other such as the DTS, SDDS, Dolby, THX sound, et al.

## WILL THE DCI SPECIFICATION BE FUTURE PROOF?

The DCI'S goal is to architect a universally applicable specification that takes into account incremental technological improvements of basic sub-systems over time, but can (philosophically) be as durable as the tried and true 35mm film format which has sustained over 80 years of universal use.

## WHAT WILL THE DCI RECOMMEND AS THE BEST IMAGE RESOLUTION?

It is MESA's estimation based on the DCI's public statements, the best case digital film image resolution will likely be established at 4,000 lines of horizontal resolution by 2,000 lines of vertical resolution. (4k by 2K) what some refer to as **SuperHD** or 4 times current HDTV resolution. 35mm film will achieve equivalent of 4K digital resolution and continue to be used for some time for shooting, but soon in 2004 is a new generation of 8 to 10 megapixel motion digital cameras that achieve the same resolution or exceed 35mm film. For more information about the Evolution of Resolution, see Technical Appendix diagram #2 at the end of this document.

MESA contends that this impending sea change is of the utmost importance for the Australian film, game and visual effects industries to prepare for this 4K future: including image acquisition, "Smart cameras", image processing for editing visual effects, virtual sets, animation, compositing, consistent color correction and "rendering intent" through the whole production chain to distribution at 4K resolutions. We are not suggesting that all content must be at 4K levels, as the likely lowest level of resolution acceptable by the DCI will go down to 2K by 1K, but not HDTV and other high-rez platforms.

## HOW TO GRAB THE GOLD (COAST) RING?

If Australia wants to be an international player within the global digital and 35mm film marketplace, the AU industry as a whole, MUST strategically unify it's voice ( just as the DCI has done) to successfully address the recommended practices within the DCI's global blue print. MESA's goal is to work with key partners in Australia (such as FIBRE and QUT-CRC) to position a commercial company in Australia as THE primary authorized Motion Picture Network Operations Center (MP-NOC) in compliance with and recognized by DCI Studio members. MESA has identified process patented '**end-2-end**' technologies to address the emerging market. This company would service both regional film/game producers and large Hollywood feature films (and games) shot, finished and distributed within Australia and worldwide.

MESA contends that low and big budget films need to be properly "content engineered" to play in major theatres and a host of existing and emerging alternative markets, made possible by means of this new infrastructure. As the technical appendix charts (# 1, 2,3) show at the end of this document, the new work flow we call **Single Source Mastering** will allow for servicing all primary and secondary ancillary markets. Positioning and properly preparing for this major transition coming in the near future could be a major boost to Australia's international film / game influence, competitiveness and sustained profitability.

MESA's adopted motto is "*be the first to be second*". To quote, Barry Rebo a HDTV pioneer.

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2. In addition to the above issues, MESA contends there are other concurrent important factors to consider "new technologies at current world 'best practice' standards"
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## TRACKING FUTURE TECHNOLOGIES

In addition to the digital distribution master plan described above. There are concurrent breakthroughs occurring or pending at the beginning of the process what we call the "headwaters" of media production that can take advantage of the new optimized pipeline throughout pre-production, production, post and distribution. MESA contends that the Australian feature film, visual effects and game production firms must be apprised of these concurrent developments in multiple fields of expertise to maintain a competitive edge in the worldwide market.

### These developments include:

- Virtual Script – a relational database integrating every creative and financial aspect of a production (TV, Film or computer/video game)
- Integrated Pre-visualization systems
- Digital Storyboards linked with Smart Cameras and virtual cinematography systems
- Super Hi-Rez 4K+ Image Acquisition
- Digital color management systems tracking color from "data capture to exhibition"
- Spatial Editing systems for live-action, 3D compositing and VFX
- New and evolving META-Data standards such as AAF and GSAM
- Pile Systems ([www.pilesys.com](http://www.pilesys.com)) and revolutionary "Polylogic Data Structures" for complex Asset Management
- Real-time 4K Archival scanning and Single Source Mastering
- New low cost, hi-rez Film Recorders and 'end-2-end' systems
- Laser optical tape and other emerging digital storage technologies such as nano-tube storage devices
- Wi-Fi enabled portable production tablet PC's (local, web, wireless, video, audio & computer functions)
- 'Studio Peer' integrated remote collaboration software (for multi-user team & student collaboration)
- Multi-platform Distribution, Exhibition, Projection and Display (laser, LCD, 3D, Organic LED's, O-LED's)
- Image formats that "render intent" to carry the artistic color look and feel via image **metadata** (Apple's QuickTime architecture) to variety of different viewing environments. (See Technical Appendix #1)
- Others to be disclosed

## INTELLIGENT STUDIOS

Competitiveness will be maintained by engineering for end-to-end integrated digital film / game production processes. We call this an "Intelligent Studio". Often times the production process hand off points are, by default, left to individual vendors and manufacturers and not the optimal method to maintain efficiency and profitability. Australia's film industry should keep an eye toward integrated production management software that MESA and partners have identified and developed working prototypes to better enable internal efficiencies and economies of scale. Also, by capitalizing on remote distance collaboration with Sydney-based **FIBRE** and it's international partners, in conjunction with MESA's 'Studio Peer' collaboration suite of software, Australia's competitive future will be greatly enhanced.

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## **4,000 LINE RESOLUTION CAMERAS: (EQUAL OR SURPASSING 35MM FILM)**

Digital Cinema cameras equal to or better resolution than 35mm film are becoming commercially available in 2004. This resolution is referred to sometimes as Super HD (SHD) or 4 times current HDTV specifications. Otherwise referred to as "4K by 2K". Current 1K or 2K HDTV cameras passing as Digital Cinema 35mm replacements are interim solutions, not accepted by the major studios or ASC (prestigious American Society of Cinematographers) but are viable for independent feature filmmakers.

## **LOW COST HDTV CAMERAS & DESKTOP EDITING SYSTEMS**

MESA believes that HD will continue to play a crucial role as an international production and learning tool for independents, film and television producers. The low cost but high quality HD "prosumer" models ( JVC & Panasonic) priced in from USD\$3,500 to USD\$5,000 and up, will be a major boon to independent filmmakers, especially burgeoning Australian independents. Concurrent low cost developments for desktop PC editing and compositing tools (Apple G5 & OSX) will allow up and coming new filmmakers to be in business for less than \$25,000. Thus allowing an expected tsunami of independent films or guerilla filmmaking, democratizing the feature film business formerly dominated by Hollywood. Spurring the low budget (less than \$1 mil.) micro-budget (less than \$100,000) or "no budget" (allowable limit on one's credit card plus friends and family's in-kind donations).

## **VIRTUAL CINEMATOGRAPHY ON THE DESKTOP**

*(LOWER COSTS MORE COMPETITIVE)*

Realistic blending of pre-visualized images and electronic storyboards, coupled with "SMART CAMERA" systems in sync with the virtual set software, will continue to be a strong and competitive growth area. These processes have and will continue to raise the creative bar and keep pace with rising audience expectations. Increasingly, low budget filmmakers can create photo-real sets and fantasy environments and feature animate films with a desktop computer, previously only possible with blockbuster budgets.

## **APPLE G5 ARCHITECTURE WITH NEW OPERATING SYSTEM RAISES THE PC BAR!**

Low cost production and post tools are increasingly powerful as witnessed by the recent introduction of the new Apple Mac G5 architecture raising the price performance bar once again for desktop filmmaking and video production. Use of the new "Pixlet" codec technology for video and audio conferencing was just introduced (6-03) within the MAC OSX and this will allow for lower cost more competitive international collaboration, priced at a fraction of the cost of existing dedicated video conferencing but not sacrificing image or audio quality.

## **GEOGRAPHY IS BECOMING IRRELEVANT**

Increasingly complex film productions require geographically and organizationally distributed collaboration with small efficient work groups using connectivity services such as those being offered by FIBRE in Australia. These services and technologies are absolutely essential for Australian companies to compete internationally.

## **4,000 LINE RESOLUTION DIGITAL PROJECTION** *(Coming soon to a theatre near you!)*

Widespread digital projection of films will not reach the tipping point (i.e. critical mass) until the implementation of lower cost, high quality projection systems. The DCI will likely specify that 4 thousand line (horizontal) projection systems will be the best resolution recommended practice, and 2,000 line (horizontal) will be the lowest acceptable format for digital films. These resolutions as defined by the DCI, and other important standards bodies in the EU and SMPTE DC-28, and Japanese Digital Cinema Consortium, are important factors to consider for future production, archiving and distribution to sustain economic viability internationally.

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## 3. "Educational and training facilities and opportunities"

### "OUT BACK" MOBILE CINEMA

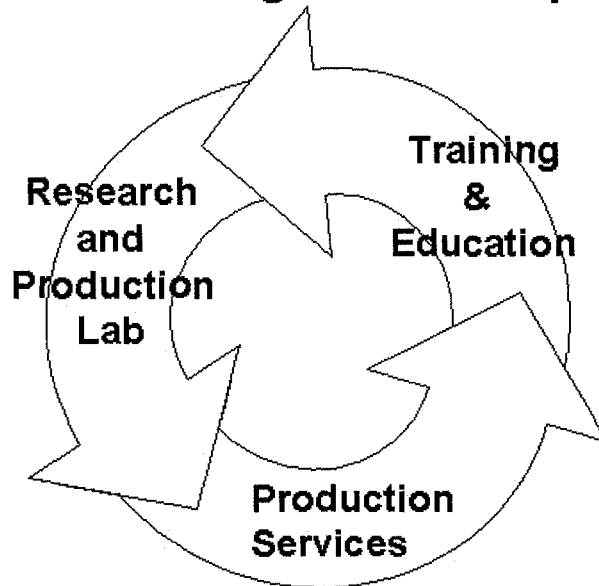
MESA in conjunction with strategic partners have developed a unique, 90 seat HD- Digital Cinema mobile theatre which can be hauled by a truck to any location. The Mobile Cinema can also double as a mobile seminar, technology training/demo room, with satellite uplink capabilities for two way video conferencing. Video dailies can be screened and the back section can be reconfigured as an "Edit Situation Room" for on location post production. This is the basis of MESA's "Studio Lab" research and production apprenticeship program that can give advanced students work on real world productions, while training the next generation of filmmakers.

### MESA'S MOBILE CINEMA & STUDIO LAB

"Advanced Digital Technology on Wheels"



## The “Intelligent Studio” Concept Closing the Loop



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#### 4. Where is the Industry Stuck = Opportunities for Growth?

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- **Fragmentation** – the requirements for digital filmmaking are very complex, therefore very few vendors make or see more than their contribution (products) as a small part of an entire production pipeline.
- **Consumption Gap** – 3G wireless, interactive television and other new media platforms have failed to create the spectacular user growth projected a few years ago. This has lowered the urgency for sophisticated content delivery systems needed to power these new services. In turn, this has caused the Major Film studios to relax their approach to new production technology, especially as worldwide cinema box office receipts and DVD sales have fueled growth at a healthy and sustained rate.
- **Time Constraints** – often the task at hand is too all-consuming to be able to have the insight, clarity of vision and/or overview to see effective solutions to a problem or a clear pathway to capture new markets. Many advances in film technology are usually accomplished on individual production projects; these are rarely shared due to maintenance of competitive advantage and a lack of strategic incentives.
- **Objectivity** – vendors, manufacturers, developers of specific products or content creators are often immersed in their agendas, quarterly quotas of existing product lines, and are often unwilling to co-operate with one another and sometimes lack a clear overview for the most effective solution.
- **Education** – there are few definitive sources of information on HD and SHD technology to enable filmmakers, producers and studios to fully understand the implications to craft an effective strategy.
- **Content Shortfall:** The worldwide market for TV, film & game development is growing exponentially with a shortage of quality content and training programs to keep up with demand.
- **Hybrid Formats:** As technology changes the way entertainment, advertising and education are created & deployed, new forms of Hybrid entertainment & visually-based learning systems need to replace “analog models” still in use. This particularly applies to passive television commercials and ‘Learning Games’.

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## 5. How can MESA help?

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MESA provides global expertise in the areas of interactive Content Development, Equipment, Systems and Data Management of Digital Film/Game production technologies:

- Enable our clients and strategic partners with the value of our experience and insight into emerging technologies, as described in the first section regarding the DCI digital film distribution rollout plans. Also, MESA can identify emerging business investment opportunities to be competitive and just ahead of the curve. "*The first to be second*".
  - To provide consulting and creative direction for film & game architecture, interactive entertainment, advertising and educational formats, including multi-platform content synchronization and fulfillment.
  - Identification of the technology roadblocks and competitive solutions for SHD production as well as the commercial and creative issues.
  - Create integrated HD and progressive scan implementation strategies including "Smart Camera", integrated Virtual Set and Virtual Script relation database production software & HD Lab 'up-conversion' technologies.
  - To create a balanced approach to Integration of Digital Filmmaking environments that focuses on creativity, remote international collaboration and outstanding user interfaces.
  - To create an enterprise approach to Media Asset Management that builds systems on recognizable and understandable technology platforms that can be financed with institutional funding.
  - To enable greater use of digital film/game production technology by creating customizable and flexible service platforms with seamless and secure communications.
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## 6. Contact Information:

The following individuals are senior directors in MESA, available for discussions & further information:

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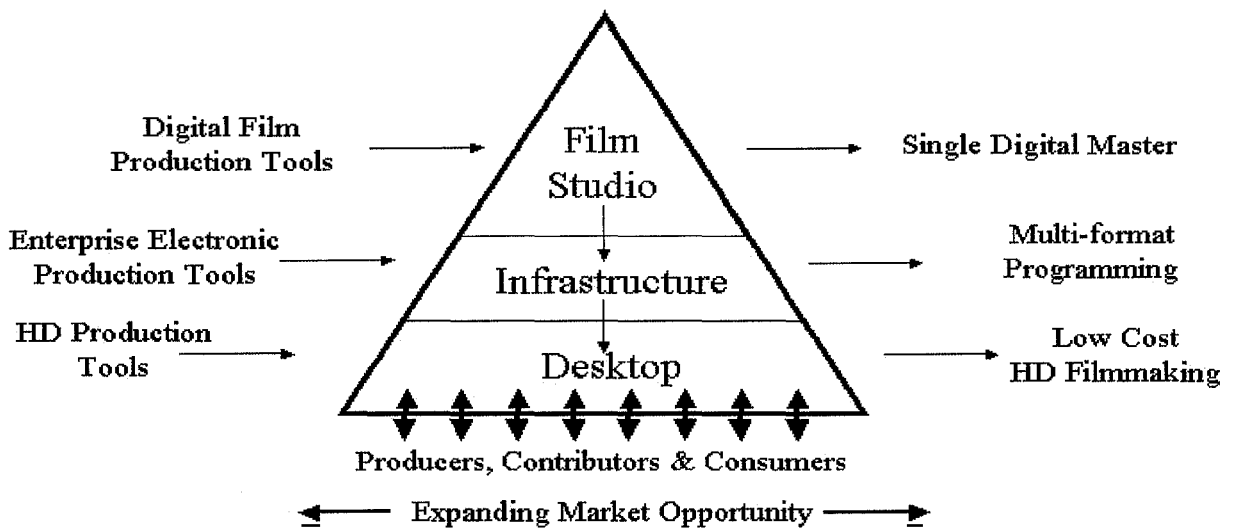


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## Technical Appendix #1

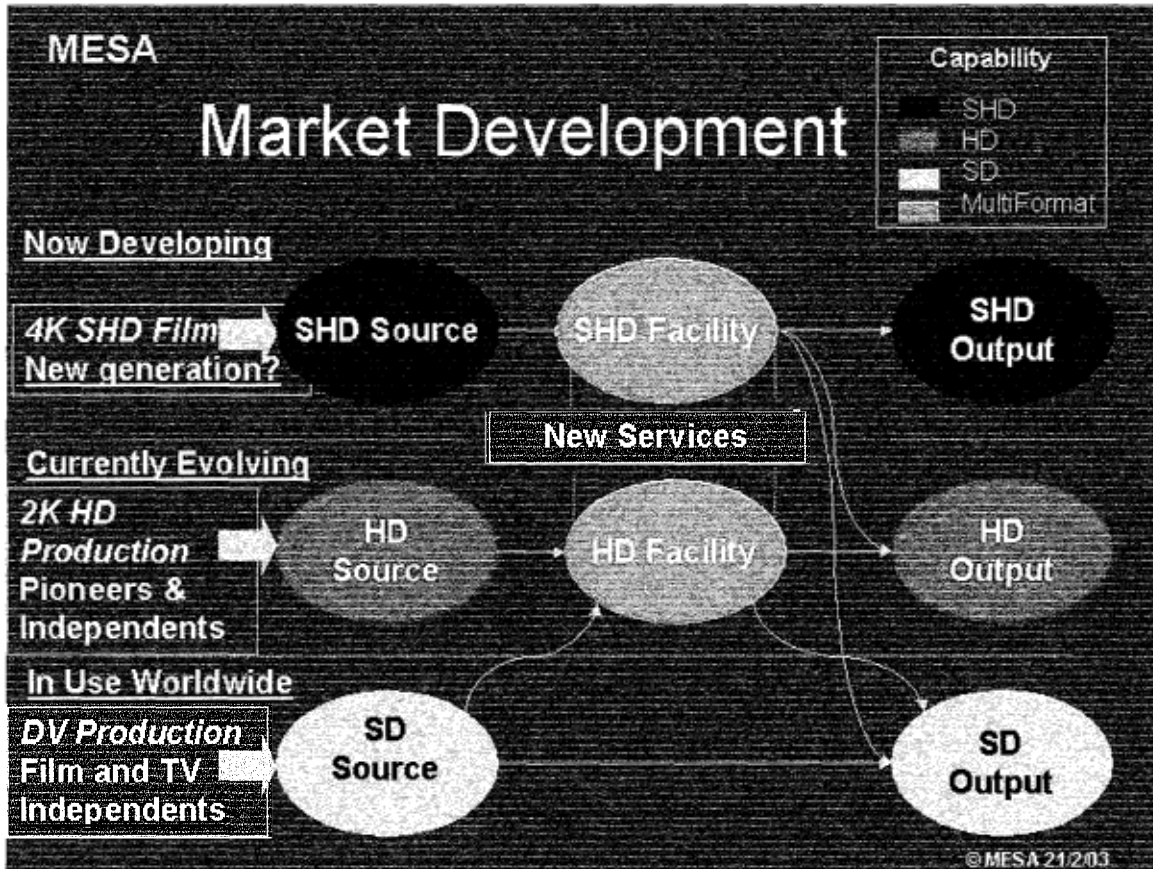
### Strategic Vision



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## Technical Appendix #2 – Evolving Resolution



### Definitions:

**SD = Standard Definition TV PAL, NTSC, SECAM**

**HD = High Definition TV, 1080i, 1080p, 720p, etc**

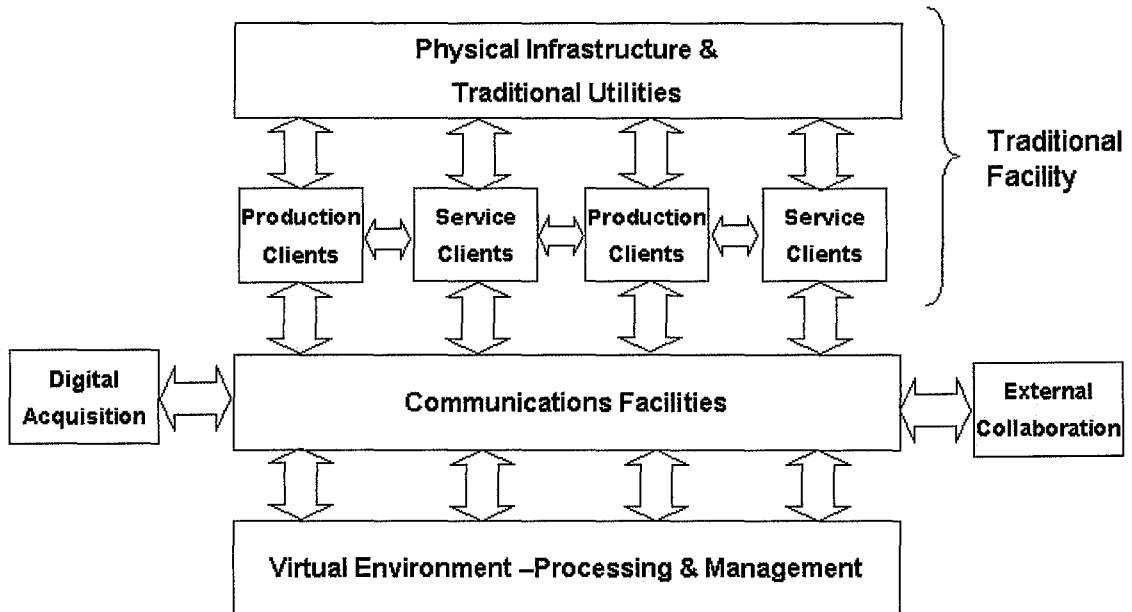
**SHD = SuperHD 4X HDTV resolution (4K by 2k)  
4,000 lines of horizontal resolution by 2,000 vertical lines  
(evolving next gen.)**

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## Technical Appendix #3

### Typical Digital Film Facility



**Physical Infrastructure and Traditional Utilities** - These are the buildings, roads, electricity, light and heat that support a film studio, and may include sound stages, edit suites and post production facilities. They can be broadly defined as an environment where a traditional 35mm film might be made.

**Production Clients** – are the film productions that use the facility.

**Service Clients** – are the related businesses that support the production clients with product and services they need for their production such as lighting, special effects and model making.

**Digital Acquisition** - removes the need for 35mm and provides instant access and availability of , standard definition SD video, High Definition HDTV, and Super High Definition (4K) images for use by the facility. This is a major enabler that makes the whole production chain and Virtual Environment much simpler and cost-effective to implement.

**Communications Facilities** - are the high-speed data networks that support all the network and communications on the site that link it all together. This network provides access to and links for external collaborators via fibre or satellite as well as providing access and distribution for both Virtual Environment and Digital Acquisition. It also links together the sites Production Clients and Service Clients.

**External Collaboration** – is access, distribution and contributions to and from related third parties such as visual effects specialists, executive producers, film studios

**Virtual Environment** - is a comprehensive management and processing platform that will handle all information and data requirements of the production process. As well as providing collaboration and conferencing tools, it will provide a secure repository for all production materials and a total production tool for assembling other output formats such as Broadcast & Interactive TV, web, wireless and DVD.