

# HPA Tech Retreat 2012

Tom Burns

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When does “Pre-Viz” stop...



...and Mastering start?



or, ...What Happened to Dailies?



# Technology Changes in Production & Post

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Multiple departments affected by continuous re-rendering:

- Pre-Viz
- Dailies
- Mastering

“A creative project is never done, it just runs out of time”

More efficient pipelines allow clients to delay final approval until the last possible moment

CBBs = “Could be Betters”



# High-end Pre-Viz toolsets

## James Cameron - Avatar

- Custom Pre-Viz engineering
- Concept VFX → Pre-Viz → final VFX



## Douglas Trumbull:

- “Every shot in a movie can now be a digital composite... achieved in real time”



# Democratization of Technology

Innovation pyramid inverted!

- Consumer economies of scale
- First smartphone feature
- Nokia largest manufacturer of cameras worldwide, Apple gaining ground
- How do we ensure correct images when “optimizations” are baked into silicon?



# More affordable Pre-Viz toolsets

## RT Rendering (fps vs. quality)

- Machinima
- Game Engines - Unreal, Minecraft, Second Life
- Kinect → iClone





# Film Dailies

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- DP & Lab were 1<sup>st</sup> to verify the vision had been captured
- The one-light was the actual work product, physically manipulated to facilitate review
- Smaller number of reviewers



# Tape Dailies

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- Improvements on a linear workflow
- Dual-sync for SD & HD in one session
- Real-time DVD deliverables
- Only post facilities had the necessary infrastructure
- Dailies colorist set look with DP
- Finish colorist could tweak it for each deliverable, or start over



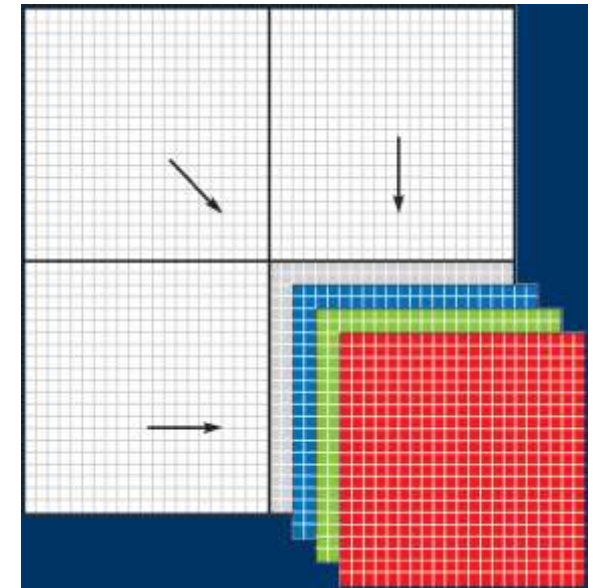
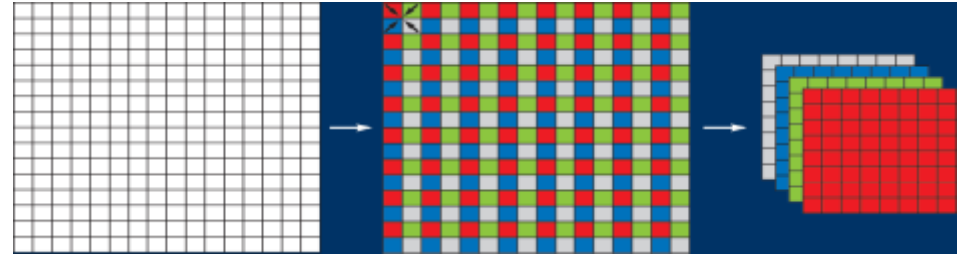
# File-based Dailies

## GPU-based Rendering of multiple simultaneous outputs

- Rec. 709 → Editorial
- DCI P3 → DPX for DI
- “linear-to-light” → VFX
- H.264 streams → Upload

## Storage, Archiving, Distribution

- Original camera file protection
- Integrity of database for downstream conform
- Export to editorial, VFX, review



**Cameras include:**



**ARRI ALEXA**  
ProRes 4:4:4

**IMAGE CAPTURE**

PRIMARY CAMERA: ARRI ALEXA ARRI: Pro Res 4:4:4  
AUDIO: DVD-RAM;  
Additional cameras used include:  
Canon 5D; GoPro\*; 35mm Film\*;  
\*Delivery of camera will be firewire drives.



**FRAMELOGIC**  
Dailies Lab



- ColorFront grade and sync
- Distributed Render
- Mac Assist
- Linux Database

**SAN**  
Local SAN attached

Dailies Deliverables

**EDITORIAL**

DNX36, graded,  
Ch. 1-1, ONE CHANNEL OF AUDIO ONLY  
CR&scene/take upper left,  
Source File name below the sc/take upper left  
Sound Roll UR, Prod TC LL, Sound TC LR,  
Record TC LC  
Avid Bin with ALE / FLEX files

**PIX**

H.264 for PIX upload, GRADED,  
Ch. 1-1, 1-2  
Same windows as editorial

**BLU-RAY**

GRADED, LUTted, ch. 1-1, 1-2  
Same windows as editorial

**DVD NTSC**

NTSC, GRADED, WIDESCREEN MODE, ch. 1-1, 1-2  
Same windows as editorial

**DNX175x**

Graded, No LUT  
No Windows

**\*NOTE:**

Currently Film gets scanned to 1920x1080 10-bit DPX  
GoPro currently gets pre-processed at Cahuenga via MTI into ProRes



COPY TO SGS SAN



- Camera original ProRes
- DNX175x for conform
- DNX36 (hold till end of season)

GoPro & Film moved from SAN to  
FrameLogic for processing

COPY DNX175x TO SGS SAN

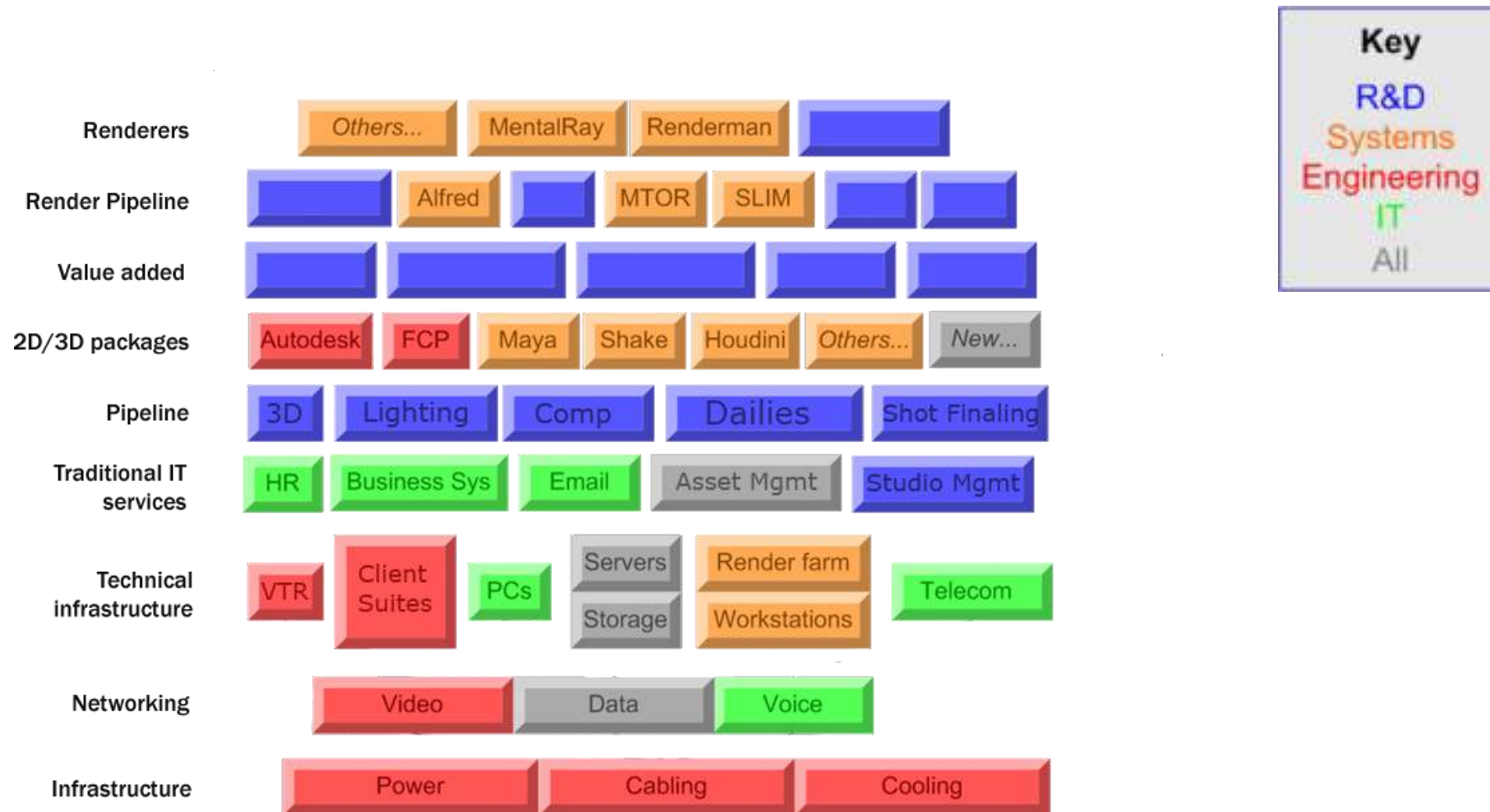


# Dailies are a process, not a product

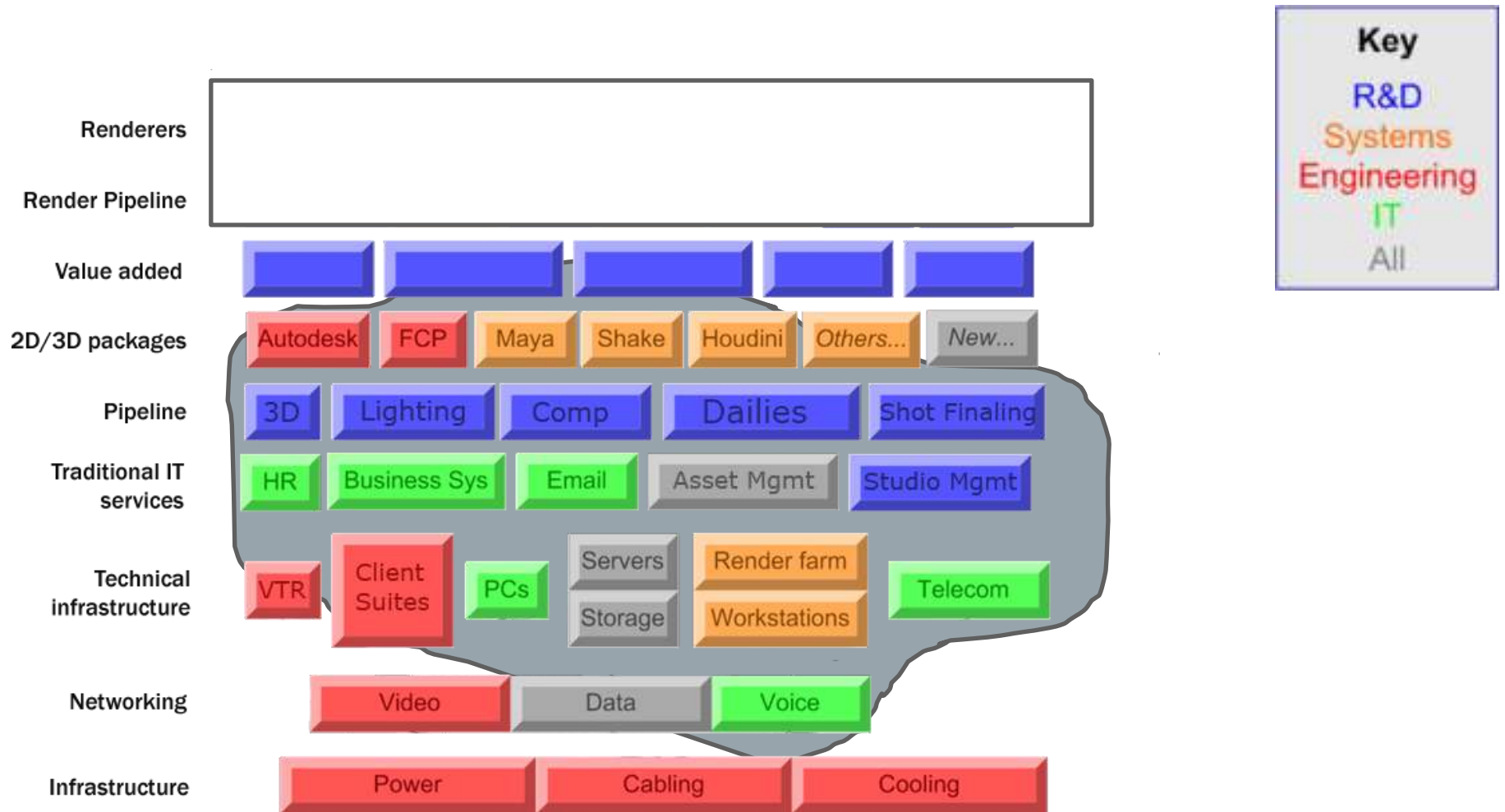
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- Improving process becomes service differentiator
- Editorial makes timeline continuously available for review
- On-set lab formats each days material to smoothly update the editorial timeline
- Editorial decisions update the production database, which drives I/O such as VFX pulls
- Process best automated on-set via shared storage

# Common infrastructure in Post & VFX (2009)



# Migration to On- and Near-Set (2012)



# Integrated, Dynamic production pipeline

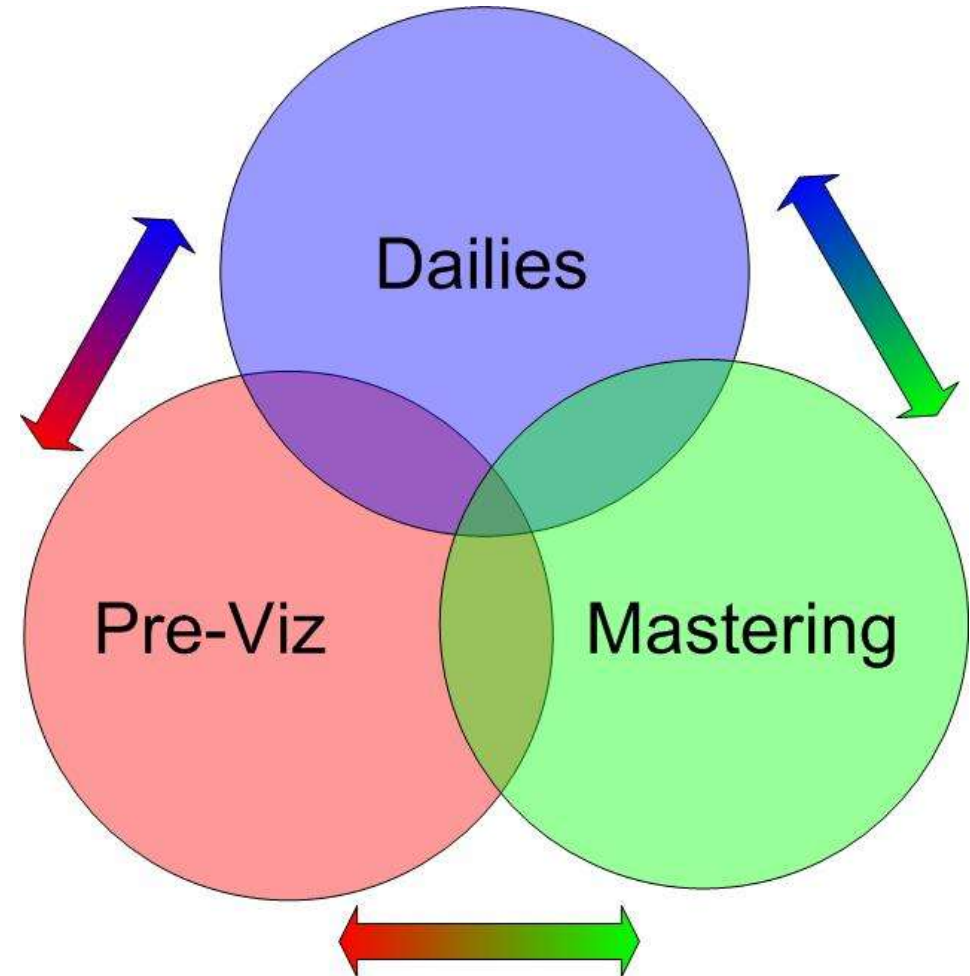
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Each area does its function well internally

Problems arise with two-way interchange between areas

IIF-ACES promises some relief

Post-production value-add is scripted automation



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# Mastering

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DCPs for Theatrical Distribution - but...

- IN → DCDM makes changes for re-release much easier
- Storage of “mastering” materials is ephemeral - who pays?

Multiple SR tape deliverables per episode per show - plus

- H.264 encode for Blu-Ray
- MPEG-2 encode for DVD
- PIX encode for networked delivery

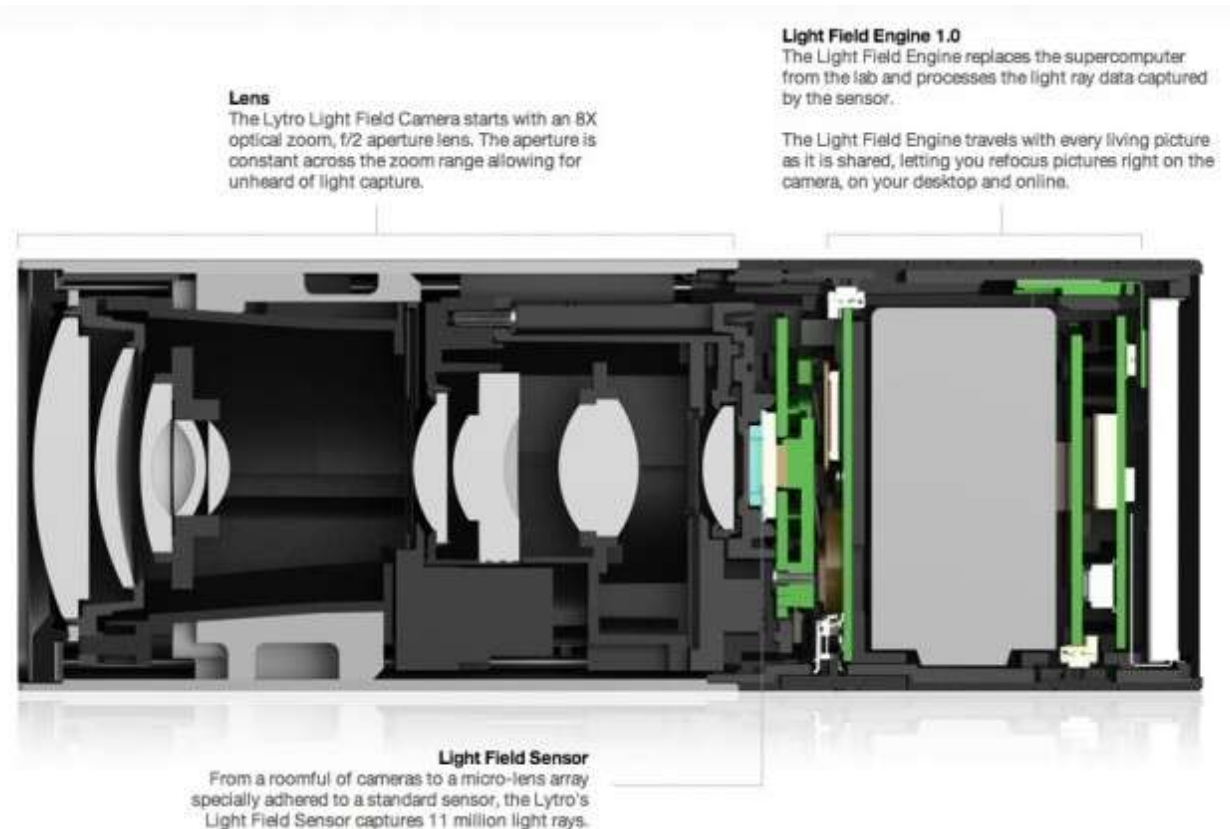
How will IMF adoption change these?



# Remix Mastering

## Lytro “Image Field” recorder

- Adjust focus, color, S3D convergence after the fact
- No fixed master exists anymore



# Throwable Panoramic camera

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32 cellphone cameras

Physical sync

Fixed geometric relationship

Image must be rendered

User navigates through  
panoramic image



Patent pending: Jonas Pfeil, Kristian  
Hildebrand, Carsten Gremzow, Bernd Bickel, Marc Alexa  
<http://jonaspfeil.de/ballcamera>

# Video Volume

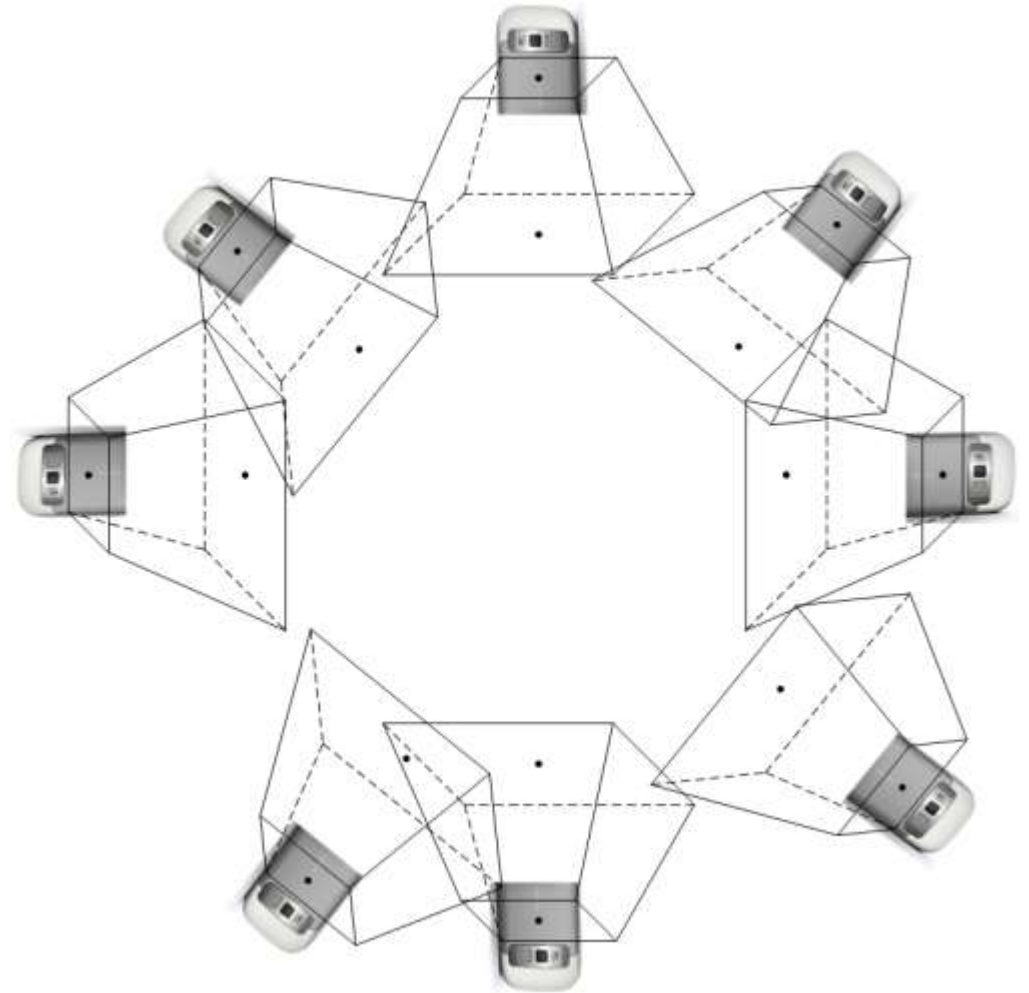
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Geo-locative sync

Derived position and overlap

Software is quite capable of stitching these image streams into a volume

Viewer can render any walkthrough after the fact



# Integrated, Dynamic production redux

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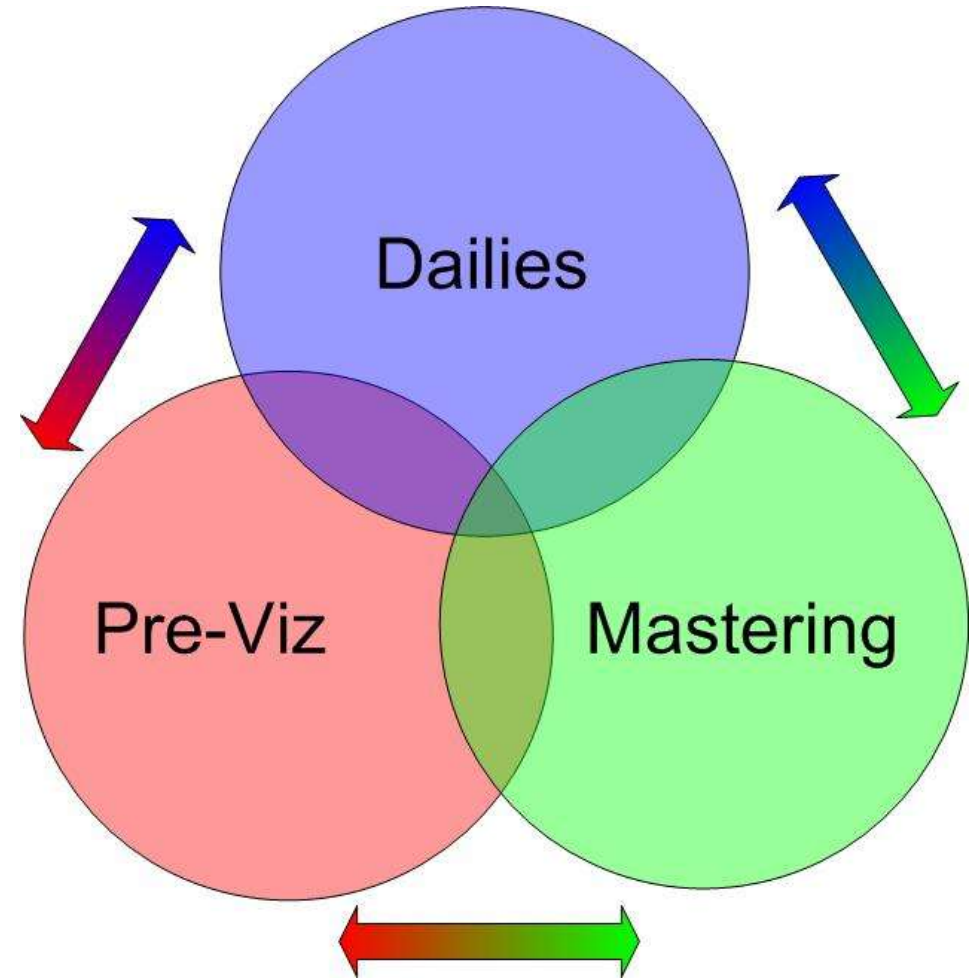
Read loosely, write tightly

Be part of an organic whole

Use pre-flight checks

Value-add for post is:

- scripted automation
- secure archiving
- database integrity
- process management
- storage provisioning



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Thank You!

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