

9 Multimedia Content Production and Management

9.1 Media Asset Management

9.2 Media Production Chains

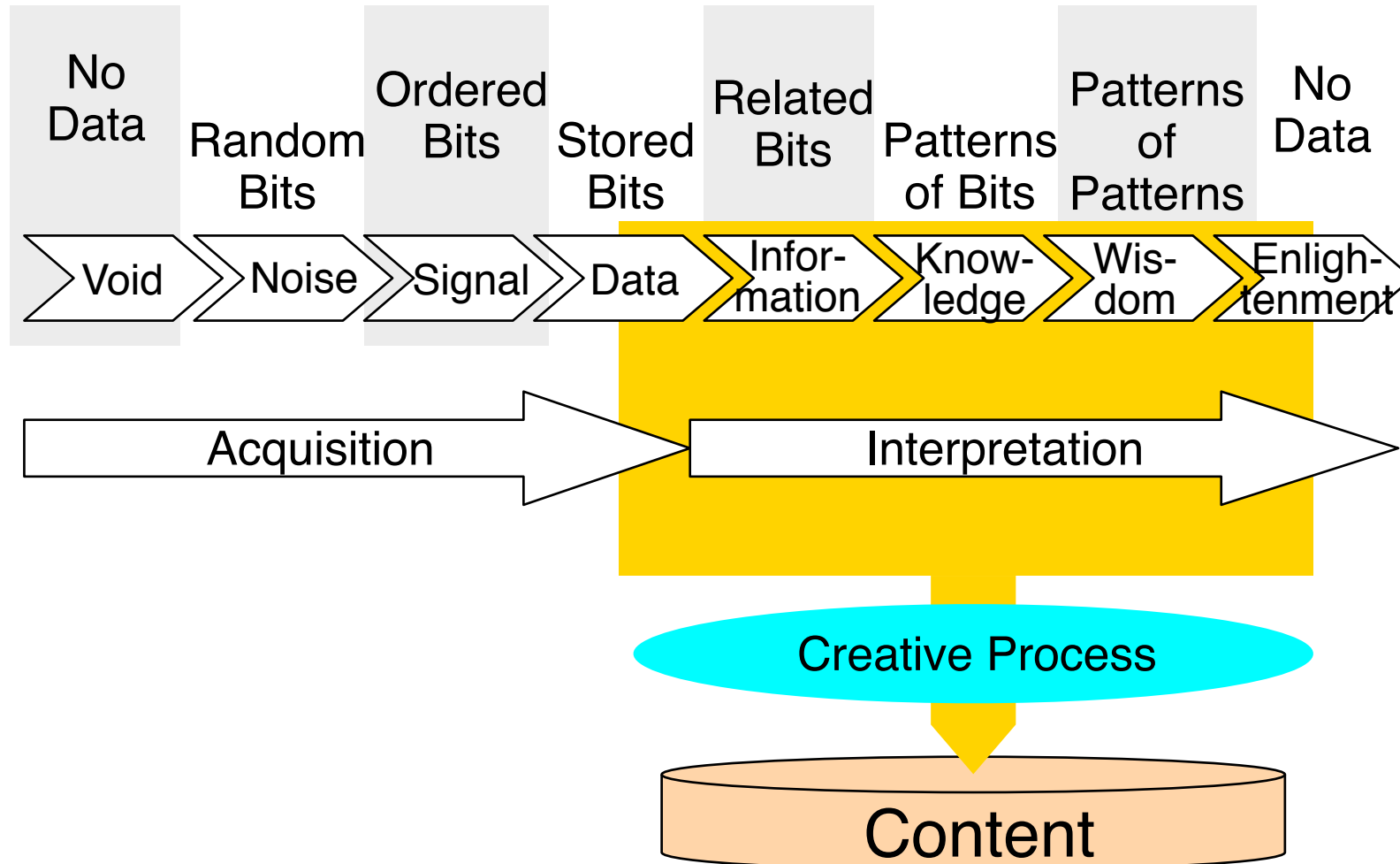
Literature:

Gregory C. Demetriades: Streaming Media, Wiley 2003

Rosenblatt et al., Chapter 10

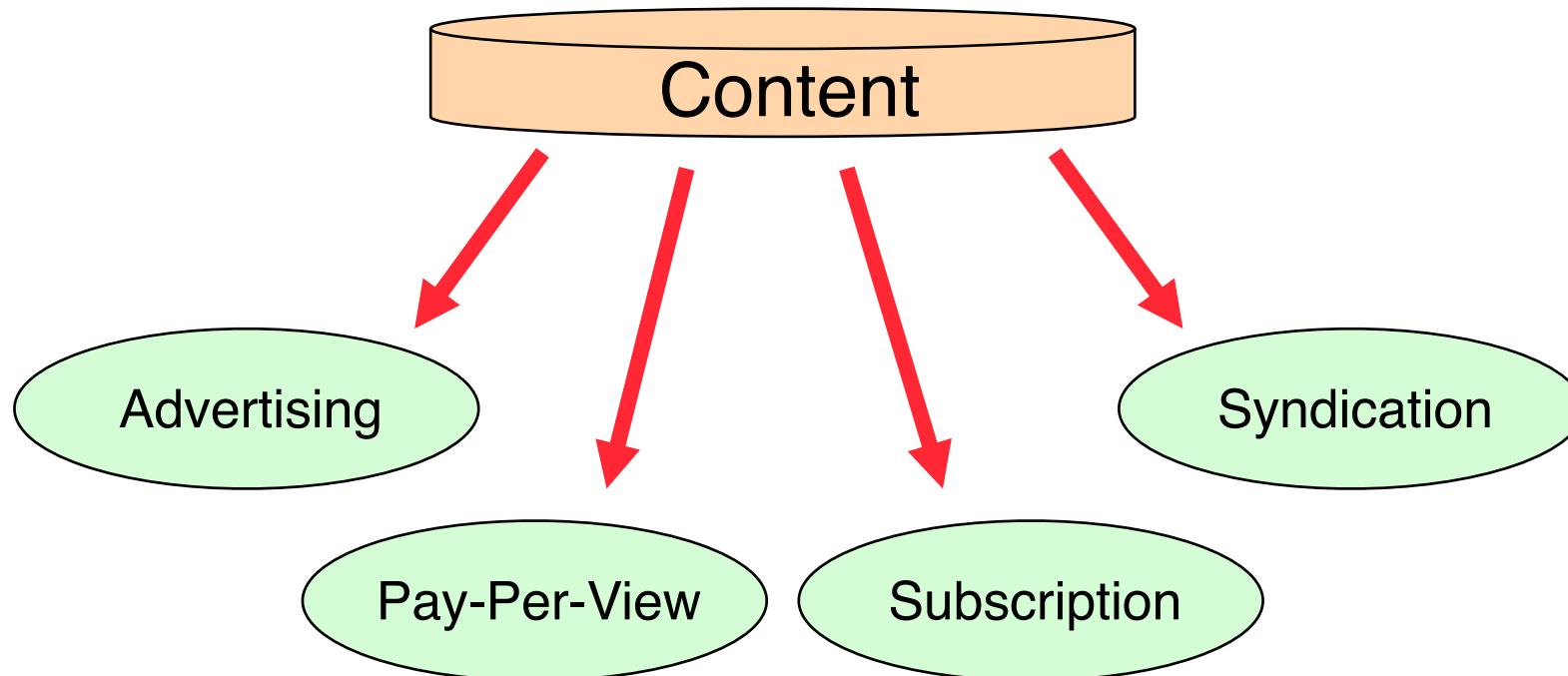
Information Progression and Content

- A holistic view according to Demetriades (p. 189) and Virage Inc.:



Content Monetization

- There are several traditional models for gaining a return on investment on content
 - Network-based media enable the integration of all models



Digital Asset Management

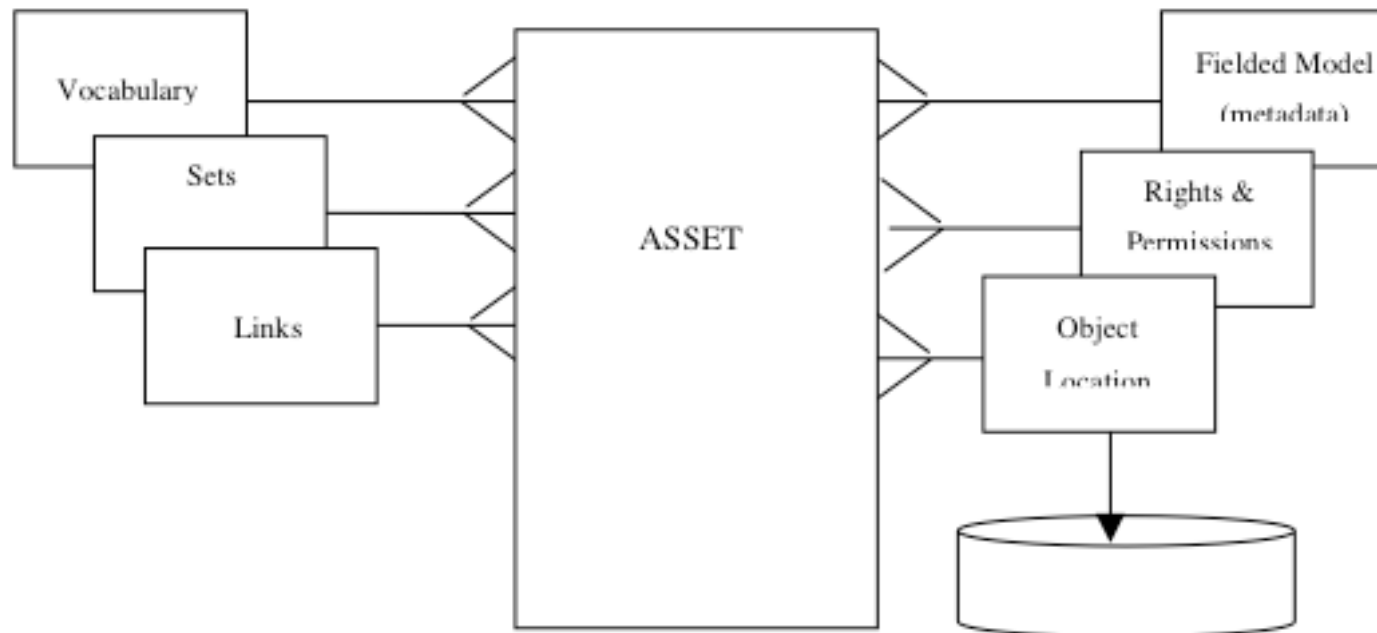
- Very similar acronyms:
 - Digital Asset Management DAM
 - Media Asset Management MAM
 - » Rich Media Asset Management RMAM
 - Digital Media Management DMM
- Basic idea:
 - To make the right media material (*media assets*) available for each specific use, in the right version and the right format
- Integration technology:
 - Workflow integration
 - Integration with various media processing tools
 - Integration with content management and syndication solutions
- Broad range of product offerings
 - From large IT companies (IBM, EMC) to niche vendors

Example: OpenText Artesia DAM

- Digital Asset Management product, see www.opentext.com
- Media ingestion:
 - Various import tools, e.g. hot folders, email
- Media file storage, access and delivery
- Complete workflow coverage:
 - Individual activities of team members
 - Group projects
- Individual view:
 - “Inbox” – What are the tasks I am assigned to, which dates, which assets
- Project view:
 - Participants, status, associated assets, events (milestones, new versions)
- Asset management view:
 - Asset-centric, navigation to various projects
 - History: “where used”, “who used”, “how used”

Asset Management, Rights and Metadata

- Quotations from Artesia White Paper “The Essential Characteristics of Enterprise Digital Asset Management”:
 - “The defining characteristic of a digital asset is that it is an asset.”
 - “There is general agreement that an asset is the asset’s content plus metadata (or data about the content). Metadata include information about ... rights and permissions ...”



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Jürgen Mayer (Hrsg.): streaming media - Internet bewegter, bunter, lauter. Markt&Technik 2001

Tobias Künkel: Streaming Media – Technologien, Standards, Anwendungen, Addison-Wesley 2001

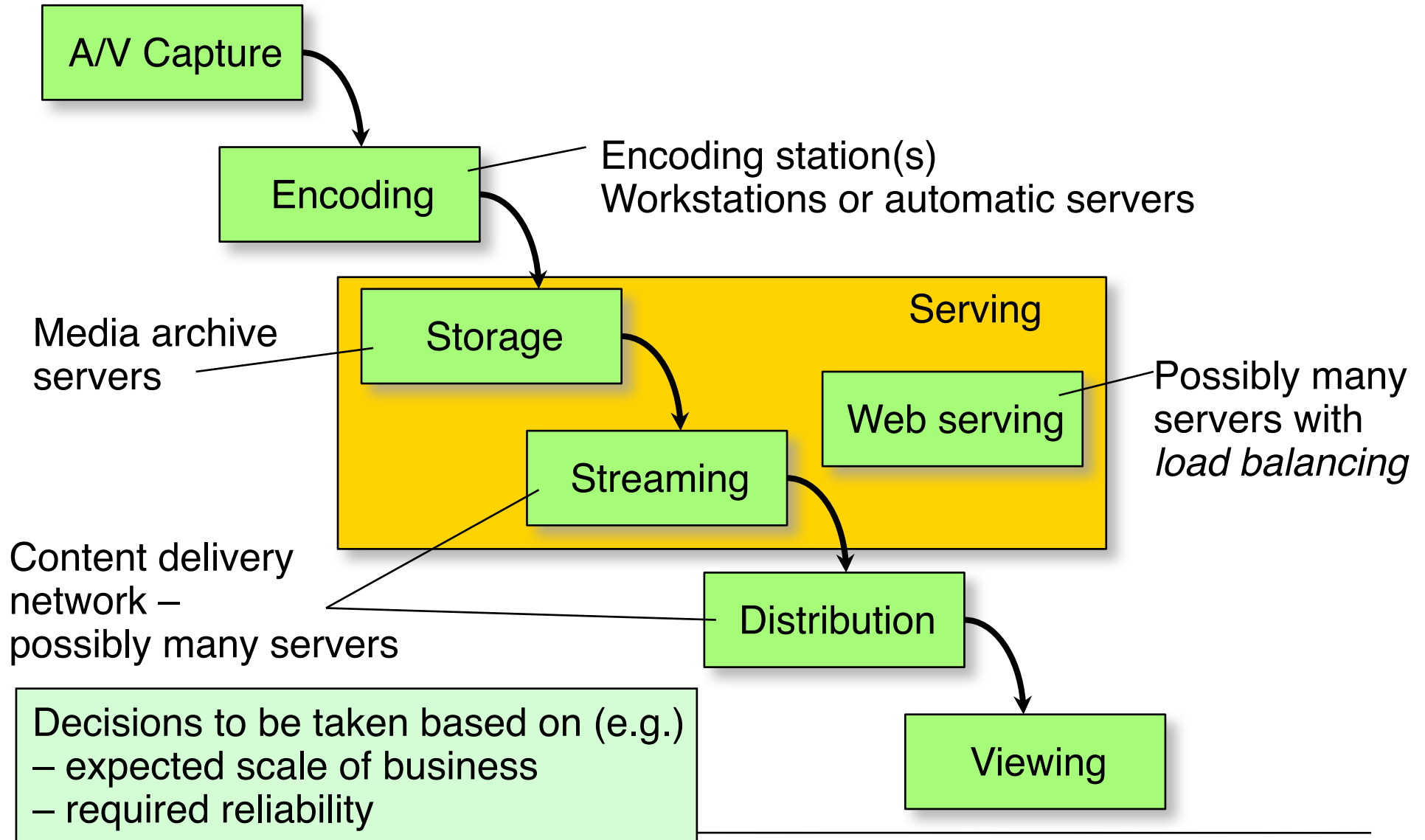
High-Level View of A/V Media Production

- Premeditate
- Capture
- Archive
- Annotate
- Query
- Message Construction
- Organize
- Publish
- Distribute

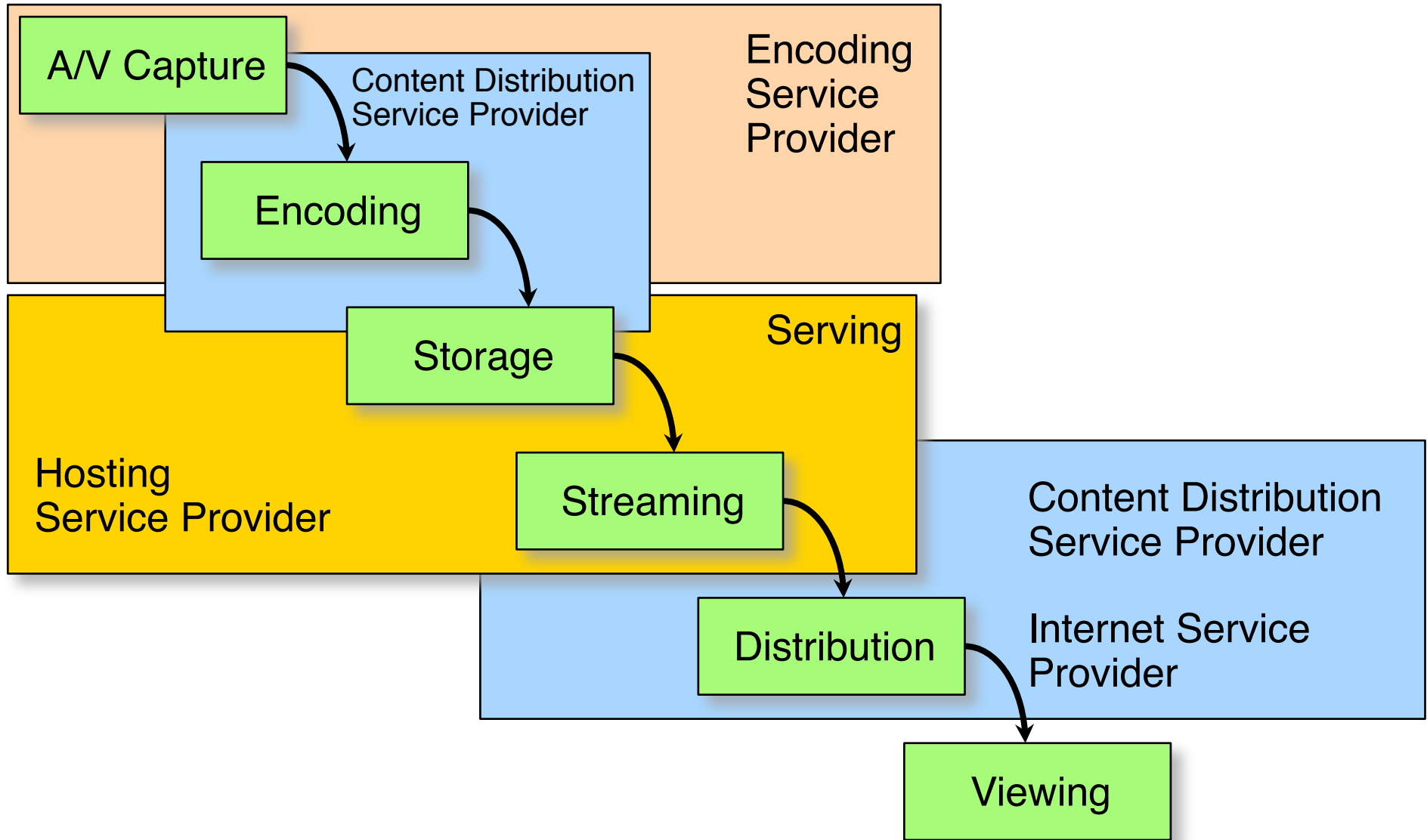
Production process of books is significantly different – but not for (online) magazines

Lynda Hardman: Canonical Processes of Media Production, CWI Amsterdam, REPORT INS-E0512 SEPTEMBER 2005

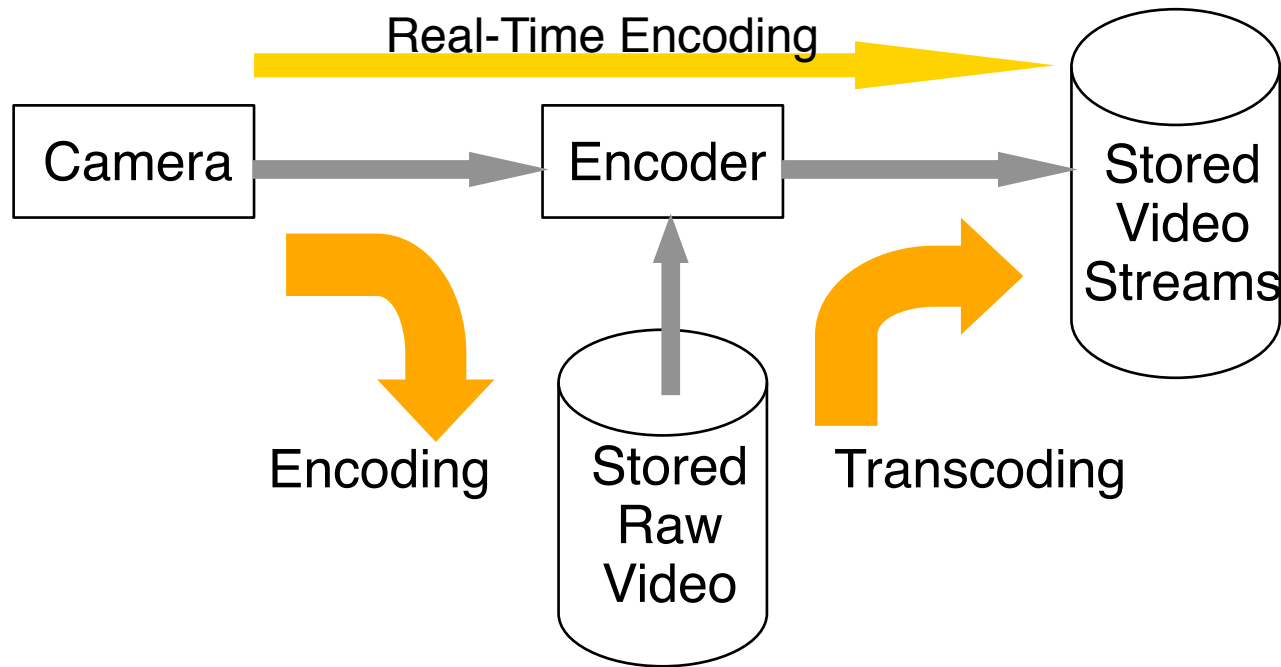
Hardware in the Streaming Delivery Chain



Organisations in the Streaming Delivery Chain



Encoding and Transcoding



- Audio and video needs to be converted for streaming delivery
 - Compression, proprietary formats
- *Transcoding*: Conversion of media files from one format to another
- *Repurposing*: Using existing content for new purposes
 - e.g. using TV ads as streaming content

Factors Determining Video Bandwidth

- Physical resolution (number of pixels)
 - Determines picture size in standard rendering resolution (e.g. 72 dpi)
 - Dependent on playback device
 - » “Set Top Box” for TV set requires full-screen TV signal
 - » Video window on PC can be adjusted in size
- Frame rate
 - Desirable: 25 fps
 - Over low-bandwidth links often only smaller rates possible (e.g. 10 fps)
- Color (sub)sampling
- Audio quality
 - Sampling rate, resolution (e.g. speech vs. CD quality)
 - Mono, stereo, multi-channel
- Degree of compression
 - Determines appearance of compression artefacts

Network Limitations

- Bandwidth towards receiver is limited:
- Effective bandwidths for various access network technologies:
 - 28.8 modem: 20 – 23 Kbps
 - 56.6 modem: 32 – 35 Kbps
 - ISDN: 45 – 55 Kbps
 - Dual-ISDN: 80 – 100 Kbps
 - DSL: 1000 Kbps and more
 - VDSL: 25 Mbps and more
 - Cable modem: 4 – 36 Mbps
 - LAN: 10 – 100 Mbps
- Compromise between bandwidth limitations and quality:
 - Picture format
 - » E.g. for 28.8 modem picture format 176 x 144 pixel (QCIF)
 - » E.g. for DSL picture format 360 x 288 pixel (CIF)
 - Plus other factors

Multiple Bit Rate Encoding

- In general, the same content has to be encoded in several qualities/ bit rates
- File allocation:
 - One file multiplexing several qualities, or
 - Several files
- Selection of appropriate quality/bit rate:
 - Dependent on network access technology and dynamic network load
 - Manual selection: Through different alternatives on Web page, or
 - Automatic selection:
 - » Using streaming server software and adequate client
 - » Often access network type stored in user preferences for client software
 - Adaptive modification (see next chapter)

Example: Multiple Bit Rate Encodings

	Video source	Broadcast (DVB)	DSL/ cable	Modem
Target data rate	(270 Mbit/s)	4 Mbit/s	500 kbit/s	35 kbit/s
Required data reduction		40:1	330:1	4700:1
Frame size	720 x 480 (CCIR 601)	720 x 480	192 x 144	160 x 120
Frame rate	30	30	15	5
Colour sampling	4:2:2	4:2:0	YUV12	YUV12
Uncompressed data rate (Mbit/s)	166	124	5	1.15
Fraction of original data rate		1:1.33	1:33	1:144
Required compression		30:1	10:1	30:1

From: D. Austerberry

Combining Media Elements to Compound Media

- Combining video streams, audio streams, text captions, graphics, links to Web locations
 - In space on the screen (e.g. video with banner advertisement)
 - Temporally (e.g. “pre-roll advertisement” with video streams)
- Enhancing interactivity and flexibility
 - E.g. free navigation
 - E.g. language options
- Technological basis:
 - Spatio-temporally structured compound multimedia documents
 - with high degree of interactivity
 - Example technologies:
 - » SMIL in RealPlayer
 - » MPEG-4
 - » Proprietary players e.g. in Flash

Automated Transcoding

- Example 1: Publishing Multiple Formats
 - Broadcaster is creating 8 hours of content per day
 - Repurposing into streaming media for Web-based Video-on-Demand
 - Live capturing, encoding (e.g. MPEG)
 - After program end: transcoding to different bit rates, delivery to streaming server
- Example 2: Flipping on Demand
 - Media archive for a cable channel to be made available through Web
 - Media kept in single, high-quality format
 - On demand (request), files are transcoded, watermarked, streamed
- Example 3: Collaboration Distribution
 - Large company working on marketing materials
 - One rough cut of a new commercial to be distributed to 100 clients with varying quality expectations and platforms
 - *Content distribution service* transcodes according to client requirements
- Example product: Telestream FlipFactory (www.telestream.net)