浙江大学计算机学院
数字媒体与网络技术

Digital Asset Management

数字媒体资源管理

任课老师：张宏鑫

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浙江大学计算机学院
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1. Introduction

1. 导论

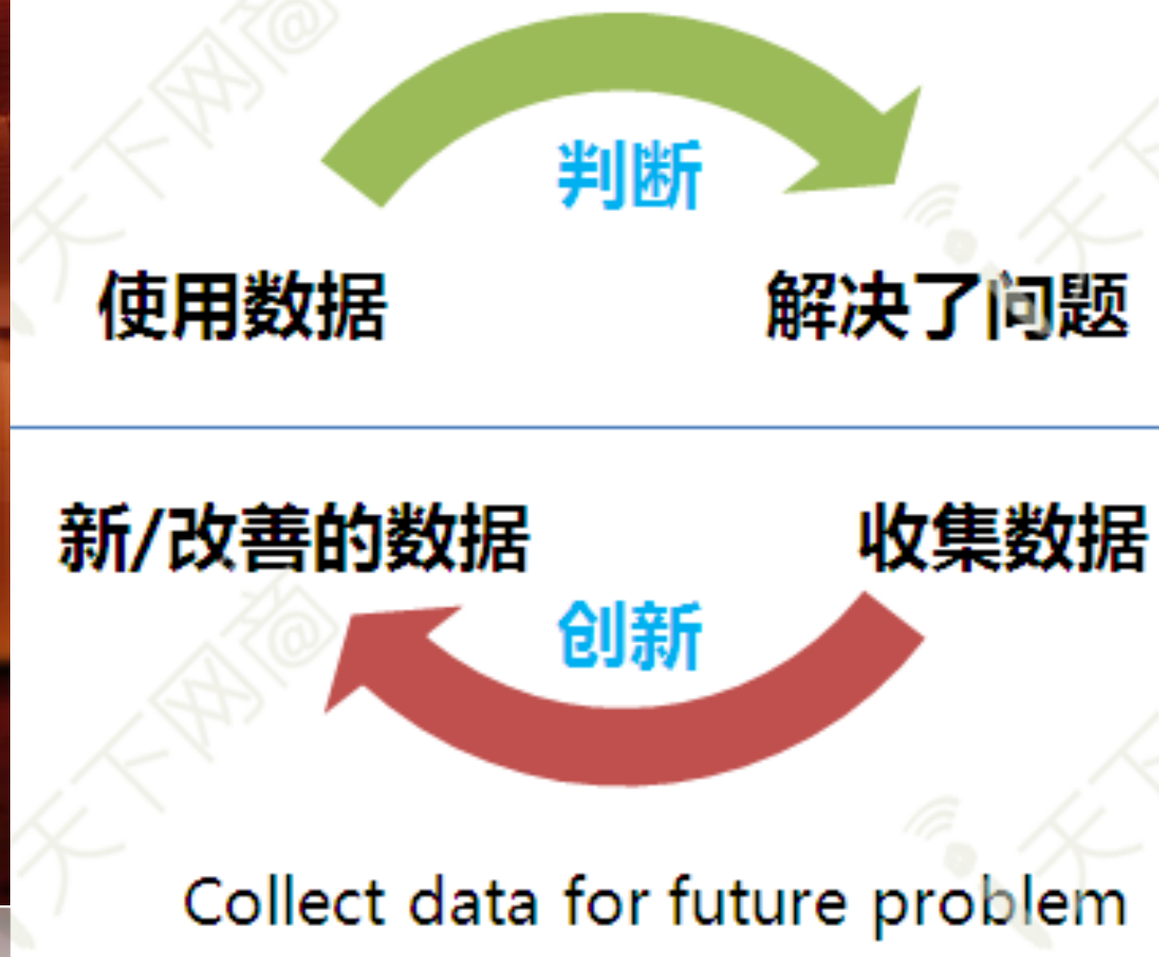
Outline

- Content management
- Industrial Analysis
- Case Study

1.1. Content management

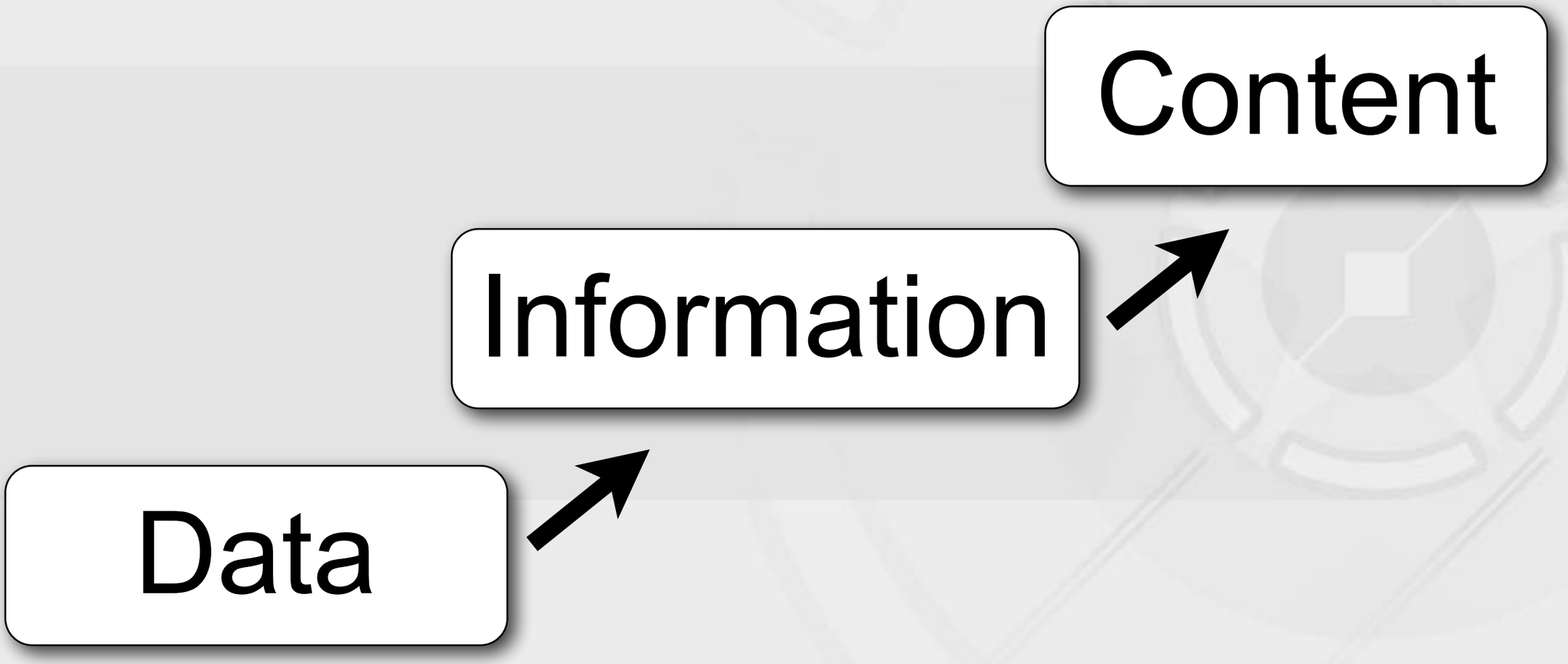
Content？（内容）

DT时代的到来



2014年，马云对全体员工发了一封内部邮件。在邮件中，马云提出“以控制为出发点的IT时代正在走向激活生产力为目的的DT(data technology)数据时代”。

Content



Content Management

- Information
  - creation, representation and exchanging

- Information media (信息载体，石刻，竹简，羊皮纸，雕塑，建筑 ...)
  - collection, organization and storage

- 古老的行业

Content Management

- Examples:
  - Ancient years： Literature in Libraries and Archives (档案馆)
  - From19th century: Continuous Media (连续媒体), movie, audio ...
  - After 1980's: Digital Media (数字媒体), digitalized ~

Content Management

- process, store and transfer (data) content
- Key: non-linear creation

- Media industry:

  fusion between traditional company (news paper, broad casting, entertainment) and modern company (google, sina, apple, facebook)

- Non-Media industry:

  data and documents in big companies, education units, research units, museums

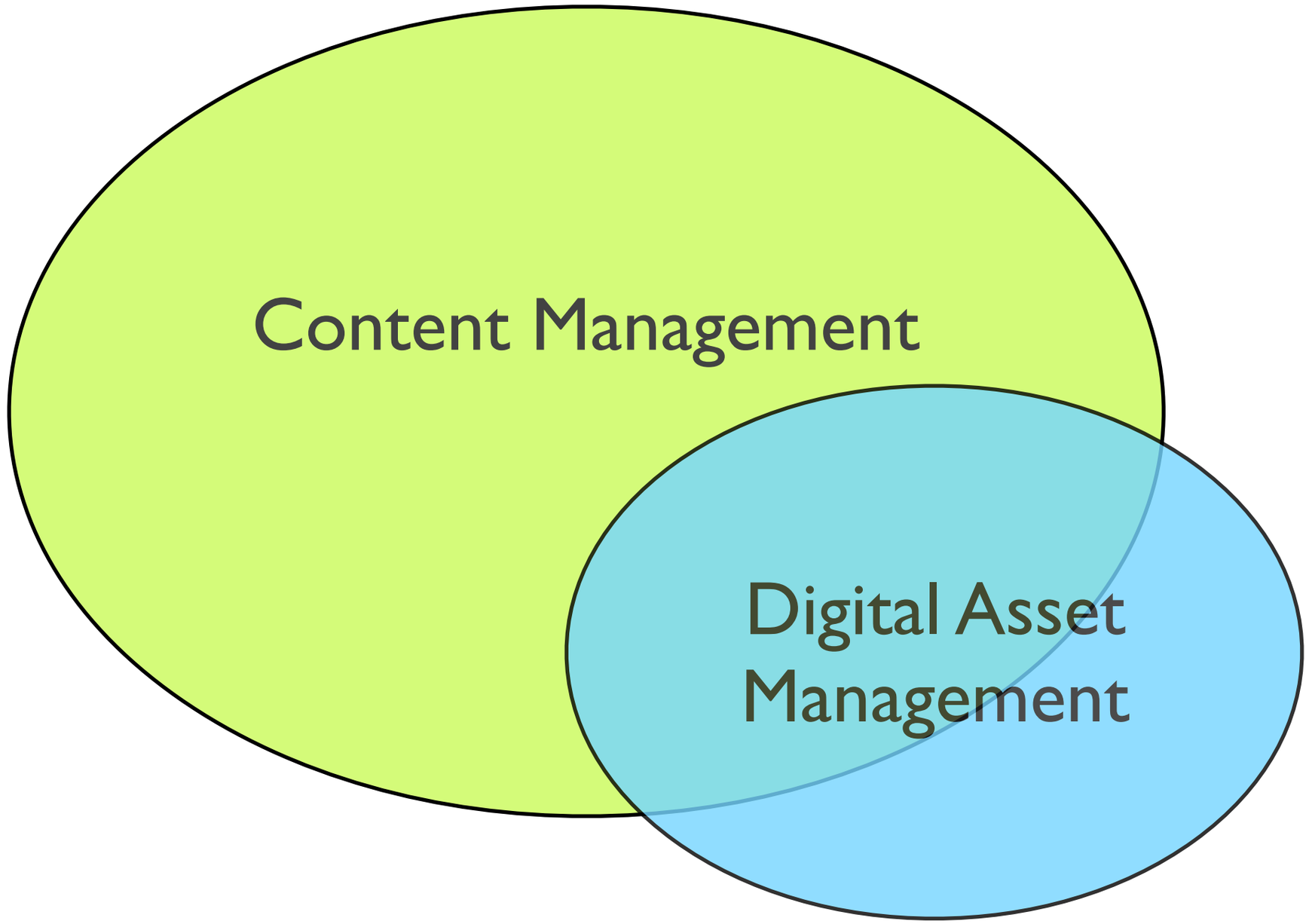
信息 / 内容的银行?

- 保险柜?
- 交易平台?
- 。。。。?

Typical CMS

- Website of a research unit
- Personal blog
- Wiki

Digital Asset Management



What is Digital Asset Management?

- Tools for organizing, storing and retrieving content in digital format
  - downloading, renaming, backing up, rating, grouping, archiving, optimizing, maintaining, thinning, and exporting ...

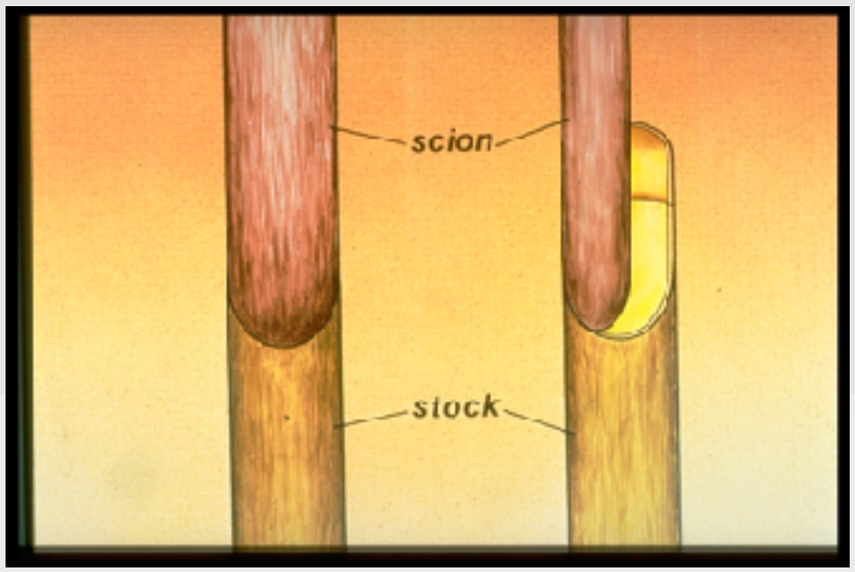
- Includes:
  - text, video, images, movies, sound, and 3D content

Content Management and DAM

- **"It's just another binary file type"** is a superficial response
  - But so is, **"It's just managing brand assets"**
  - Digital Asset Management involves
    - Much higher **storage volumes**
    - More complex **ownership** and **usage rights**
    - More **complex content** (layers)
  - However, an organization needs a **unified content management/digital asset management strategy** to avoid unnecessary costs in hardware, licensing, software development and support

Examples of Digital Media (Asset)

Illustrations



Photographs

More Digital Media (Asset)

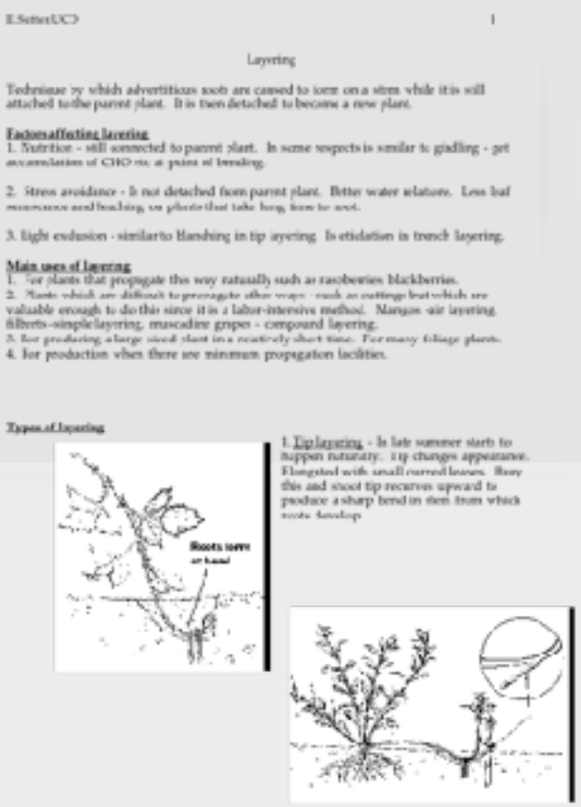
Sound

Movies

Animation

Document

Hypermedia document



E.Sutter/UCO 1

Layering

Technique by which advertitious roots are caused to form on a stem while it is still attached to the parent plant. It is then detached to become a new plant.

Factors affecting layering
1. Nutrition - still connected to parent plant. In some respects is similar to girdling - get accumulation of CHO etc at point of breaking.

2. Stress avoidance - is not detached from parent plant. Better water relations. Less leaf maintenance and breaking on plants that take long time to root.

3. Light exclusion - similar to blanching in tip layering. Is etiolation in trench layering.

Main uses of layering
1. For plants that propagate this way naturally such as raspberries blackberries.
2. Plants which are difficult to propagate other ways - such as cuttings but which are valuable enough to do this since it is a labor-intensive method. Mangos -air layering filberts -simple layering, muscadine grapes - compound layering.
3. For producing a large sized plant in a relatively short time. For many foliage plants.
4. For production when there are minimum propagation facilities.

Types of layering

1. Tip layering - In late summer starts to happen naturally. Tip changes appearance. Elongated with small curved leaves. Bury this and shoot tip recurves upward to produce a sharp bend in stem from which roots develop

Text

Nutrient Media

Nutrient Media

Nutrient media for plant tissue culture are designed to enable explants to grow in a totally artificial environment. In order to enable plants to grow in vitro, scientists have devised nutrient media that provide the nutrients readily available in soil. In addition to mineral elements which make up the macro- and micronutrients present in fertilizers, nutrient media also contain organic compounds such as vitamins, plant growth regulators, and a carbon source.

Mineral elements

One of the most successful media, devised by Murashige and Skoog (Murashige and Skoog, 1962) was formulated by analyzing the inorganic components in tobacco plantations and then adding them to media in amounts similar to those found in the plants. Not only did they find that the ions themselves were important, but the form in which the ions were supplied were critical as well.

Macronutrients

Macroelements consist of N, K, P, Ca, Mg and S.

Nitrogen (N) - Nitrogen is required for general growth and is essential to plant life. Most inorganic nitrogen is converted to amino acids and then to proteins. The two most widely used forms of inorganic nitrogen used in plant nutrient media are the nitrate ion (NO_3^- oxidized) and the ammonium ion (NH_4^+ reduced) which are added as inorganic salts. Nitrate is usually added at concentrations between 25 and 40 µM and ammonium between 2 and 20 mM. In many nutrient media, one of both forms helps maintain pH. Many plants appear to grow best if given both forms, although the reason for this is not known. In devising media, both the total amount of nitrogen as well as the relative amounts of NO_3^- and NH_4^+ are important. When the ammonium ion is used alone it may be toxic. Inorganic nitrogen generally ranges from 25-60 mM in nutrient mixes. Nitrogen may also be added in an organic form as amino acids, hydrolysates (such as casein hydrolysate) and organic acids.

The organic forms of nitrogen such as amino acids are often useful when added to media that lose ammonia/ammonium. One advantage of using organic nitrogen is that it is already reduced, the form in which most nitrogen exists in the plant and thus may be taken up more readily than inorganic nitrogen. Organic forms of nitrogen cannot, however, totally replace inorganic forms. One danger of using amino acids is that here TOO MUCH can be added in which case feedback inhibition can occur. Biochemically the cell senses that there is a great deal of aspartic amino acid and consequently change the metabolic pathways to stop the natural production of the amino acid. This results in the production (or building up) of intermediate compounds which in turn may disrupt normal metabolism.

The form of nitrogen is often critical depending on the kind of culture. There is a difference in the oxidized and reduced forms. The two main forms of nitrogen used are ammonium (NH_4^+) and nitrate (NO_3^-). The form of nitrogen affects the pH. When both forms of N are used there is a rapid uptake of ammonium (the more readily available form since it is reduced) which results in a decrease in pH to about 4.4. At lower pH the uptake of nitrate is preferred and thus the pH rises. Nitrate is used in addition to ammonium because the ammonium ion in excess is usually toxic. Also pH would be much more difficult to control with just ammonium.

Plant Biology 139: Plant Tissue Culture 2)

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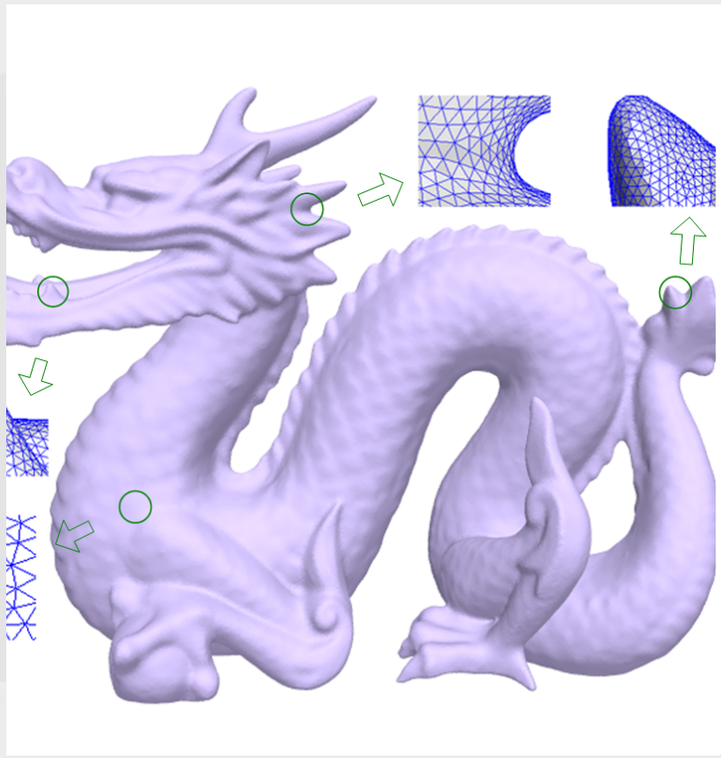
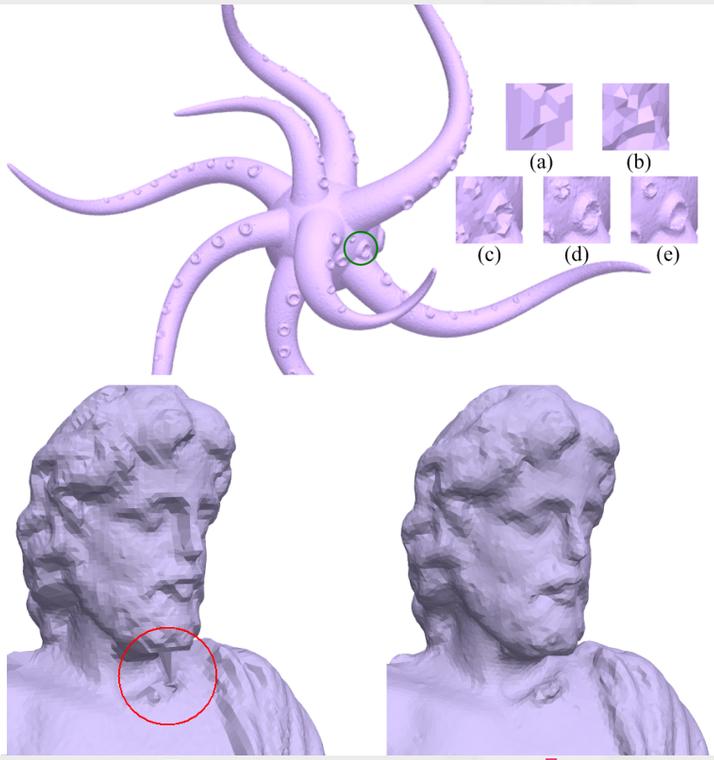
3D content





3D printer / scanner ...

Kinect…

UE4 Content

Content

- Essence (素材) + Metadata （元数据）
- Intellectual Property Rights (IPR, 知识产权)
- Digital Right Management (DRM, 数字版权保护)

Why Do We Need DAM?

- Average creative person looks for a media file 83 times per week
- Fails to find it 35% of the time
- DAM reduces failure to 5%

Digital assets are not simple bits.

What Can DAM Do for You ?

- Catalog large numbers of formats
- Create a visual category using thumbnails
- Add keywords, data fields
- All fields can be searched
- Select images for an electronic gallery - specific lecture topics
- Share over the internet

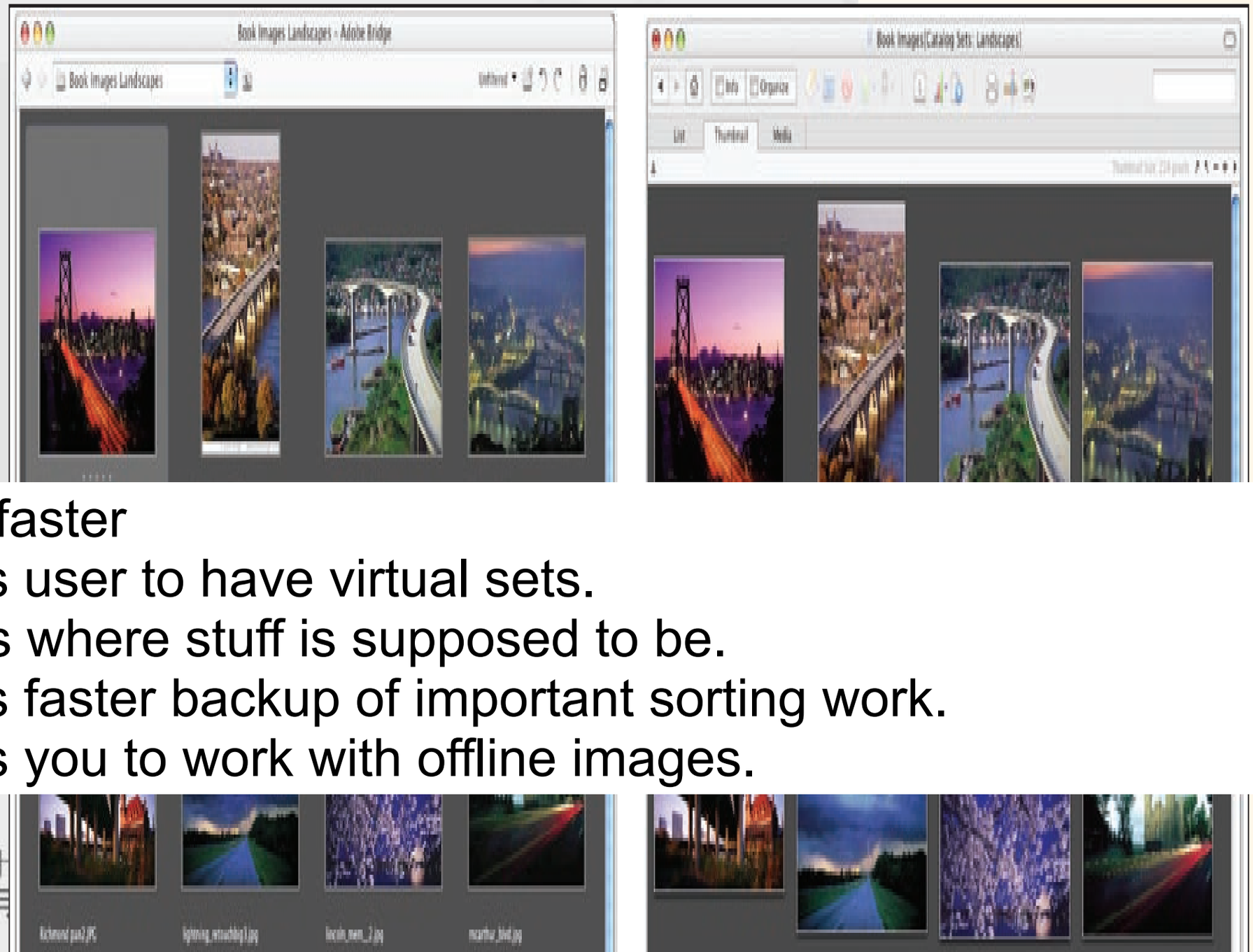
DAM Example: Picasa

Photo Management: Client Software + Web Service

Rules of sound DAM

- Systematize
- Don’t rely on your memory
- Be comprehensive
- Build for the future
- Do it once...
- But don’t overdo it

Browsers v.s. cataloging



- DAM faster
- allows user to have virtual sets.
- knows where stuff is supposed to be.
- allows faster backup of important sorting work.
- allows you to work with offline images.

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Browsers v.s. cataloging

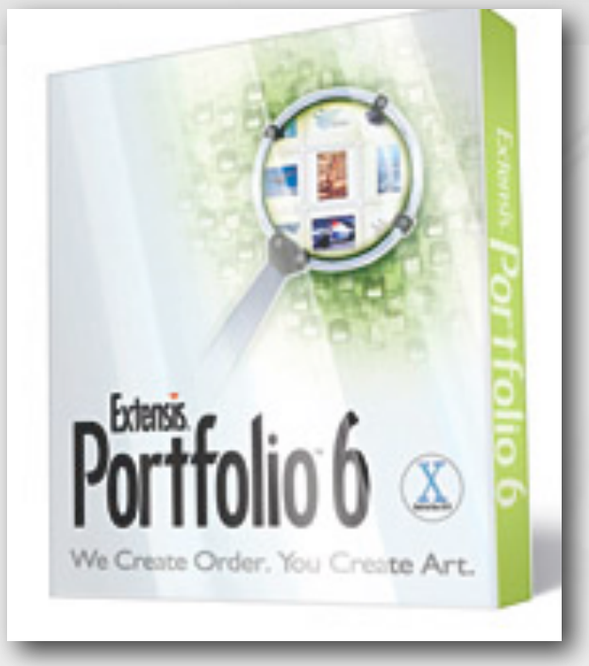
- Browsers:
  - Photoshop Bridge
- Cataloging software
  - Google Picasa
  - ACDSee

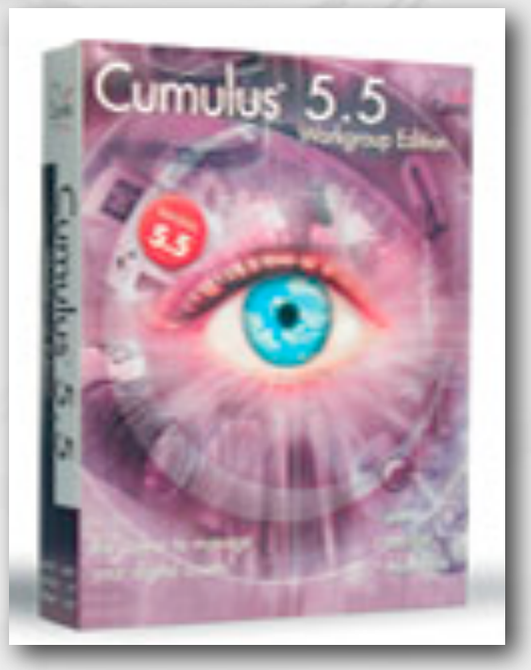
Solutions

From most extensive and expensive to least financially damaging

- Enterprise solutions
  - $35,000 + (can be in millions)
- Middle tier - interdepartmental
  - $3,000 - $5,000 +
- Desktop level
  - $100-500 + (depending on server requirements)
- Future, SaaS (cloud) solution
  - free or very low price

Desktop Solutions





Desktop Solutions

- Avid Technology - Alienbrain
- Extensis - Portfolio
- Canto - Cumulus

Each of these programs is easy to use. Demonstration copies are available on the web at
www.alienbrain.com (Alienbrain)
www.extensis.com (Portfolio)
www.canto.com (Canto)

Open Source Solution

http://www.opensourcedigitalassetmanagement.org

1.2. Industrial Analysis

DAM: Past and Present

- Digital Asset Management initially established Niche Markets, including
  - Publishing, Media and Entertainment
  - Broadcasting – Media Asset Management
  - etc.

DAM: Past and Present

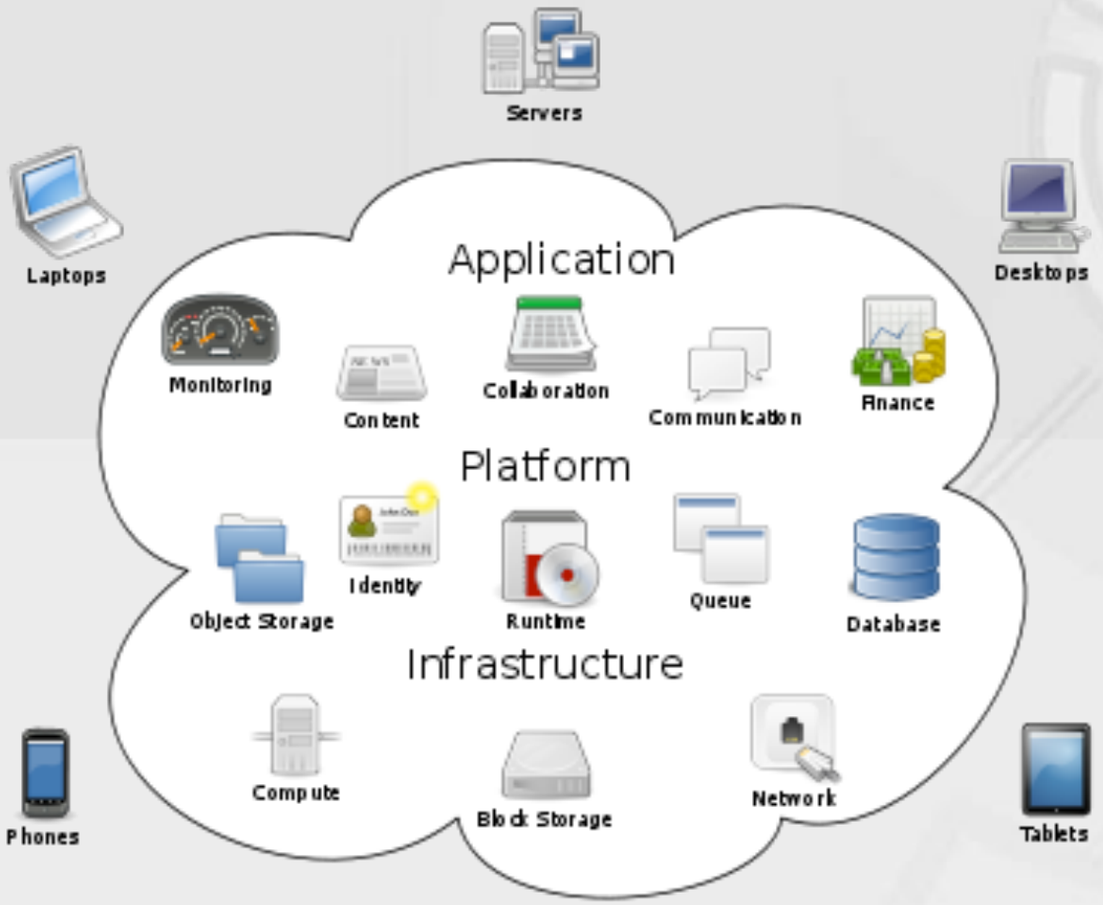
- Now on the Verge of Going Mainstream
  - Integration into
    - Enterprise Content Management and
    - Document Management Strategies
  - Cross Industry
    - Financial Services, Pharmaceuticals, Consumer Packaged Goods, etc.
  - Mainstream Vendors

DAM: Past and Present

- 淘宝电子书 http://ebook.taobao.com/

DAM: Past and Present

DAM system is moving to



Cloud Computing

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Digital Asset Management
– Case Study

Case Study #1: Music Publishing

- Apple (iTunes)
- Leading music publishing firm
  - own millions song copyrights and supports 100 countries and territories
- Client needed a means to further maximize and manage the value of the song copyrights that it owns through promotion, licensing and royalty processing
- Client decided to turn all their internal processes and data outward, making them available to business partners and associates everywhere, at all time

Case Study #1: Music Publishing

- Key technical aspect was integration of numerous IT systems including several territorial:
  - databases, search, application server/portal
  - not just simply a packaged DAM system deployment

- Outcome was the world's largest digital rights management (DRM) system

Case Study #1: Music Publishing

- Apple's iTunes (data 2011)
  - > 8,500,000,000 music sale
  - > 84,000,000 iPad
  - > 13,000,000 iPhone
  - > 350,000,000 iPod
  - > 400,000,000 iOS devices
  - > 435,000,000 iTunes users

Now More than 100,000,000 iPhone!

Case Study #2: Cable Television

- Leading cable television network: multiple premium channels/multiple multiplex channels
- Client needed more effective means to provide affiliates access to digital assets: marketing materials, programming information, ads, etc.
- Client also needed ability to request print materials and to order services (e-commerce transactional back-end integration)
- Client required a single 3rd party system integrator that could:
  - Span technologies: Digital Asset Management, Content Management, Application Server, Portal
  - Span core competencies: Creative Design, Back-end Integration, etc.
  - Take over where a previous 3rd party systems integrator left off

Case Study #2: Cable Television

- Google TV: Android based
- Apple TV? IOS based ...

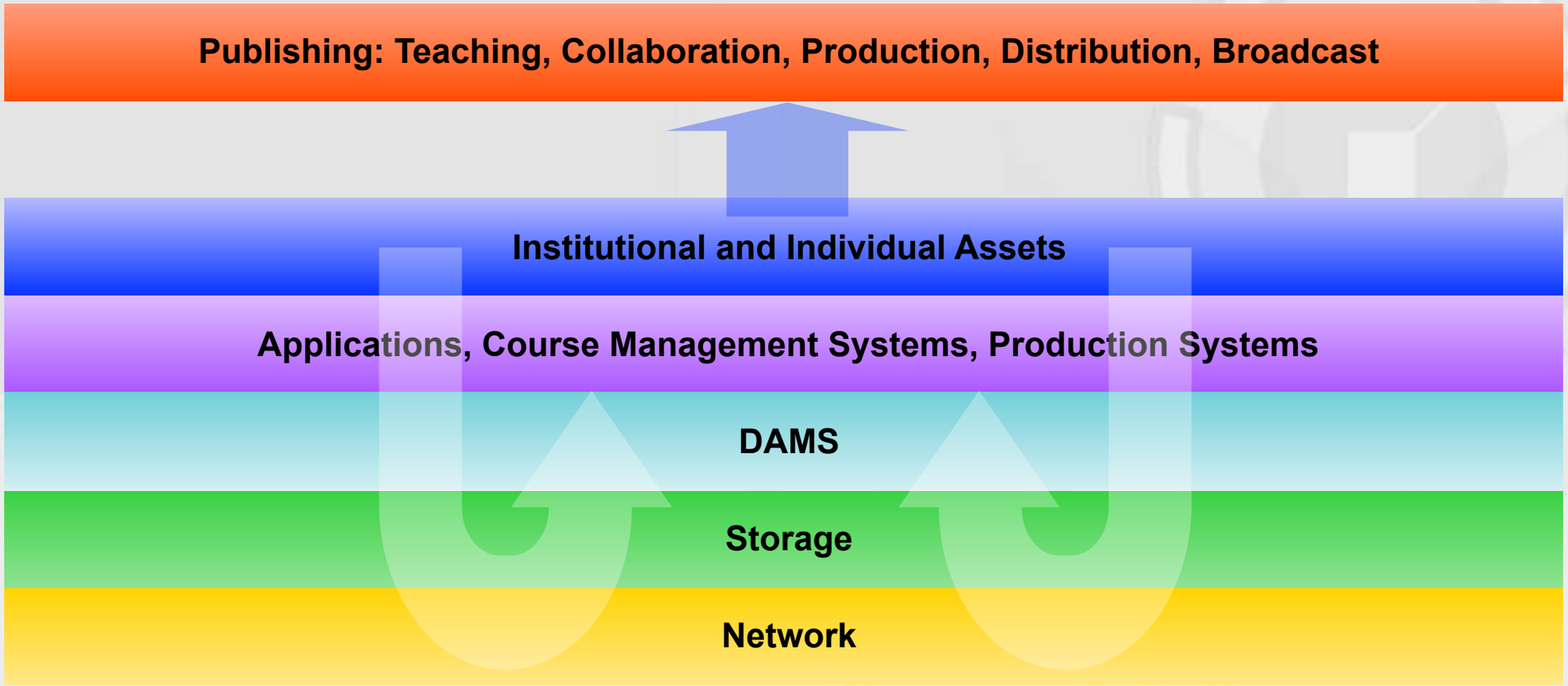
Case Study #3: A Digital Asset Management System at **University of Michigan**?

- Create a robust infrastructure to ingest (获取), manage, store and publish digital rich-media (富媒体) assets and their associated metadata.
- Streamline the “workflow” required to create new works with digital rich-media assets.
- Build an environment where assets are easily searched, shared, edited and repurposed in the academic model.
- Provide a campus-wide platform for future application of rights declaration techniques (or other IP tools) to existing assets.

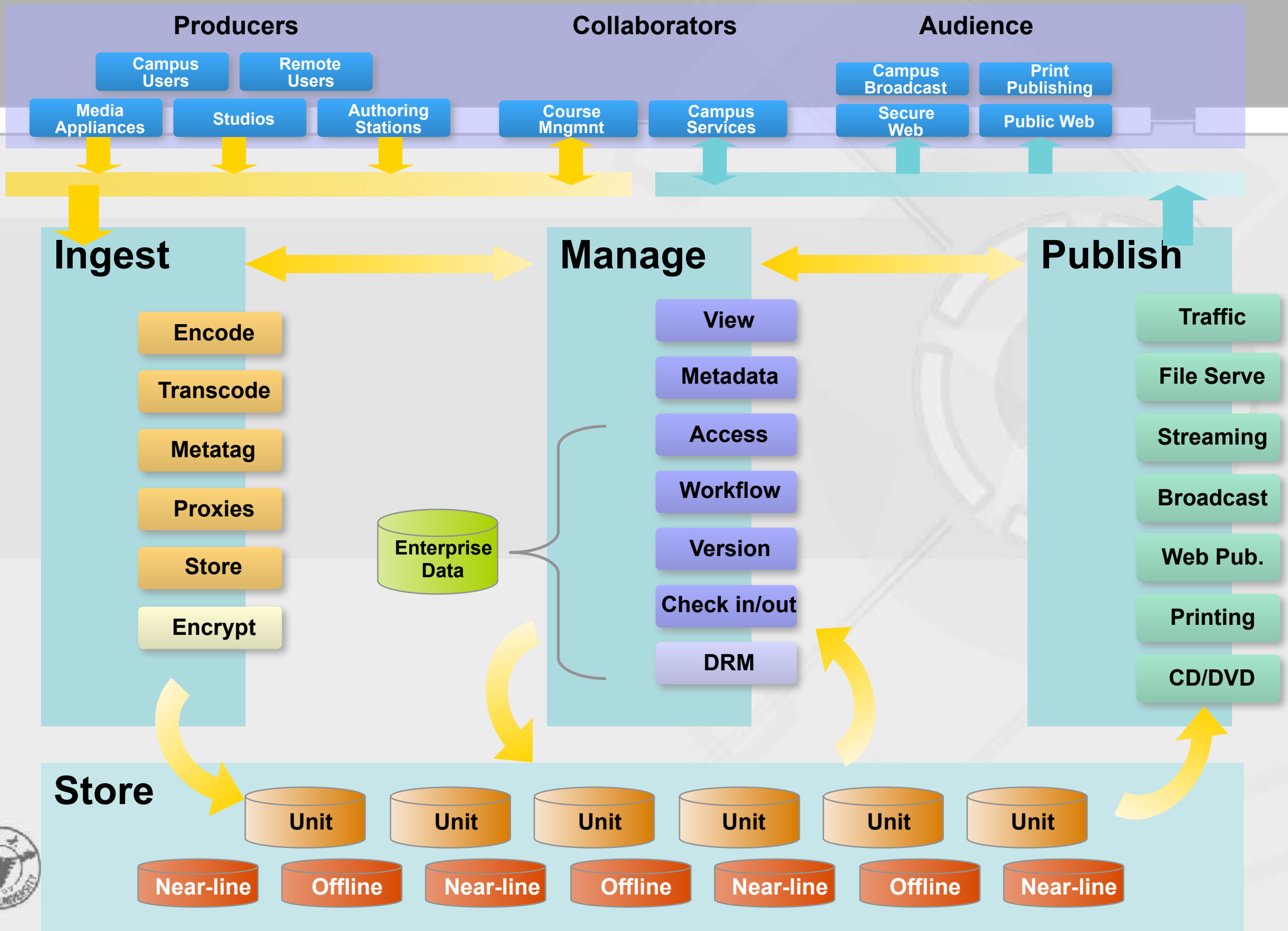
Orientation of DAMS at the UM

- Infrastructure level
- Tuned for rich media (time-based)
  - video
  - audio
  - 3D VR modeling and animation
- Capability for non time-based data (text, numerical data, still images)
- Metadata collection and management: automated or semi-automated
- Campus-wide availability
- Not primarily a content management tool nor production tool
- Coordinate with planned campus storage management practice
- Distributed management (authorization, roles, access lists)
- Integrated with centralized campus data services
- Plan for digital rights-declaration/management services

What is the place of DAMS in the campus infrastructure?



DAMS Component Services



DAMS Living Lab Configuration

Remote Source:
- Telestream ClipMail Pro
- FTP upload of existing digital file

Local source:
- Tape Deck
- Live Media Stream
- Scanner
- Existing Digital File

Asset Processing

Virage
Encoding & Logging
Metadata Extraction
Speech-to-text
Voice, face recognition

Telestream Flipfactory
Transcoding
Metadata Extraction
Proxy Creation

Streaming Servers
IBM VideoCharger
Apple QuickTime
1 TB storage

Remote iSCSI Storage

1TB

Resource Manager

Accept Media Server
Metadata creation
Version control
Check-in/out
Workflow
XML
Websphere

IBM Content Manager
Metadata Mngmnt.
Resource Management
Security
Cosign single sign-on

DB2
SMART
Self-Management And
Resource Tuning

Tivoli
Storage Management

Library Server

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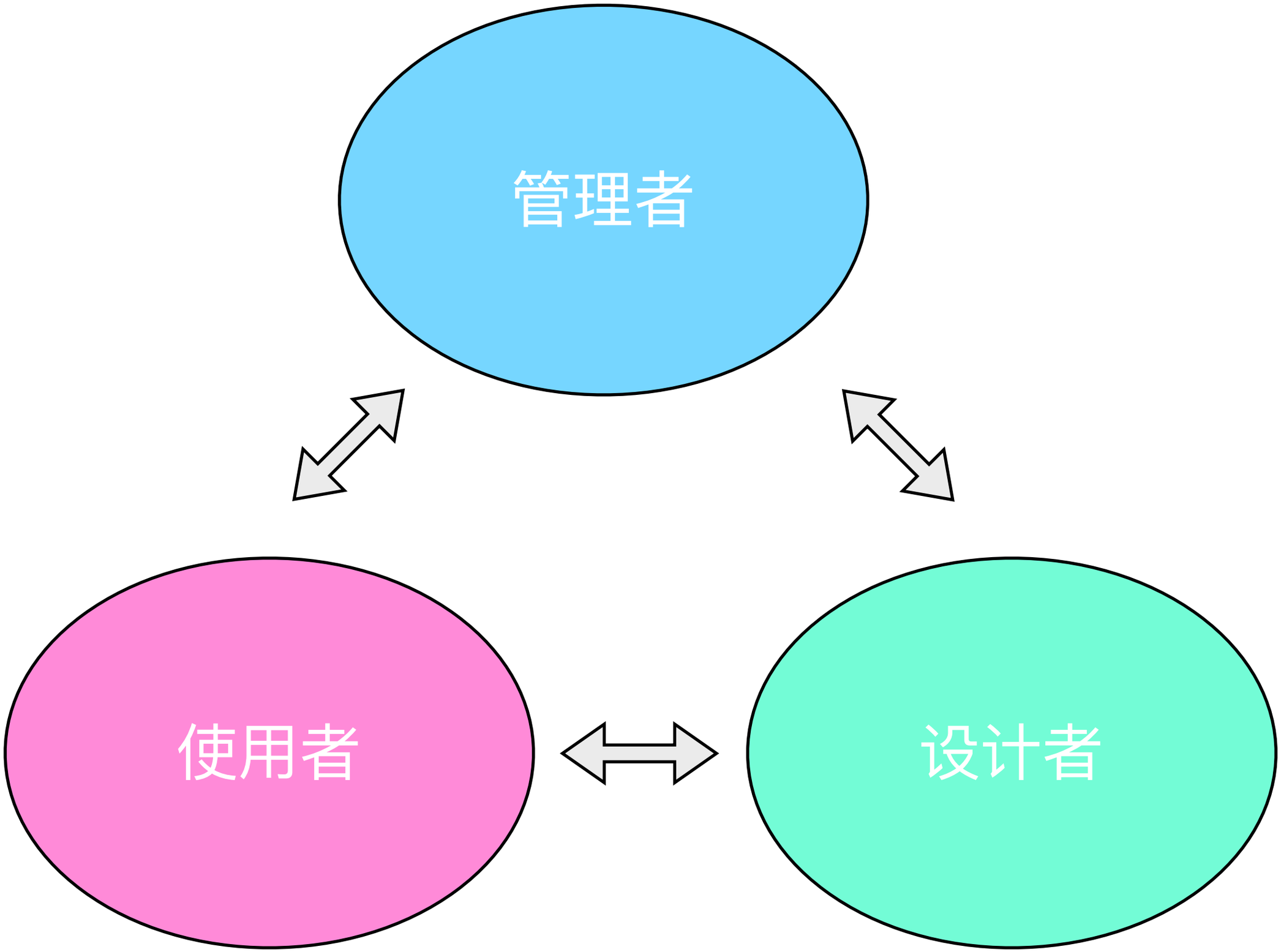
Extreme case ...

- Iron Mountain (铁山)：世界上最安全的数据中心
- http://digi.tech.qq.com/a/20100819/000388.htm

数字媒体资源管理系统



Homework today

- Send an e-mail containing to TA
  - **damzju@163.com**
  - include your name, ID, e-mail address
    - wechat number (not necessary, but recommended),
    - talk something about **Raspberry PI**
    - even a brief greeting to TA
- It's A0