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

3. Multimedia Database Technologies

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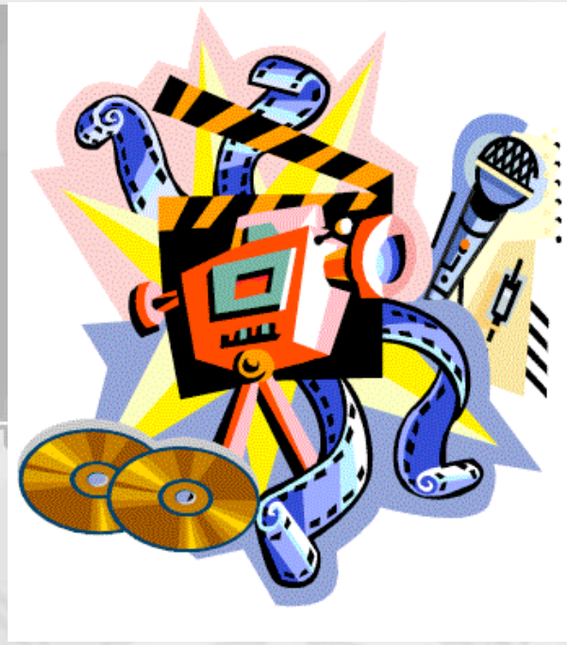
Summary of Multimedia Database

What's Multimedia?



- Multi => Many

- Media:
  - A means to distribute and represent information: Text, graphics, pictures, voice, sound and music..
    - Perception media (how do humans perceive information?)
      - Audio/visual media
    - Representation media (how is information encoded?)
      - ASCII, JPG, MPEG, PAL.
    - Presentation media (medium used for output/input)
      - Input/output media (keyboards, papers)
    - Storage media (Where is information stored?)
      - Magnetic disk, optical disk

What is Multimedia?

- Serious definitions:

  “From a user’s perspective - multimedia enables computer information to be represented through audio, video, text, images, graphics and animation.”

  “Multimedia is defined as an interactive computer-mediated presentation that included at least two of the following elements: text, sound, still graphic images, motion graphics and animation.”

What is Multimedia?

- Multimedia involves **Many Media**
  - **THE MEDIA DOMAIN**

- Multimedia involves **Computers**
  - **THE SYSTEMS DOMAIN**

- Multimedia enhances the **presentation and communication of information**
  - **THE APPLICATION DOMAIN**

Classification of Media Types

- Media types can be divided into two groups:
  - Temporal (Continuous media)
    - Time or more exactly time-dependency between information items, is part of the information itself.
    - dynamic, time-based, continuous
    - e.g., audio, video, music, animation
  - Non-temporal (Discrete media)
    - Time is not part of the semantics of the media.
    - static, non-time-based, discrete
    - e.g., text, graphics, images

Challenges about managing MM data

- Huge Size
- Quality of Service (QoS)
- Synchronization
- Content-Based Retrieval

Challenges about managing MM data

E.g., in Oracle 9i…

Name	Data type	Size	characteristics
BLOB	*Binary*	*4Kb in table space* *4GB in ext. space*	*random access;* *transaction support*
CLOB	*Character*	*4GB*	*random access;* *transaction support*
NCLOB	*National character sets*	*4GB*	*random access;* *transaction support*
BFILE	*Binary*		*Read only;* *external file*

SQL and multimedia data

e.g., in Oracle 9i, after the following:

```
CREATE  TABLE  Grape
        (grape_name VARCHAR2(25) primary key, picture BFILE);
CREATE DIRECTORY “PHOTO_DIR” AS ‘C:\PICTURES’;
```

The user can then do insert:

```
INSERT INTO Grape(grape_name, picture)
    VALUES (‘chardonnay’, BFILENAME(‘PHOTO_DIR’, ‘chardonnay.jpeg’))
```

Challenges about modeling MM data

- High level content abstraction is natural to the way humans think

- Effective modeling of MM data is critical
  - support for semantically rich conceptual contents
  - ability to represent diverse aspects of the data to be modeled
  - facilities for dynamic concept enrichment and expansion
  - incorporation of knowledge of low level data
  - isolation of the user from the low level representation and storage levels

Definition- MMDBMS

- MMDBMS
- Multimedia Database Management System
  - *a **framework** that **manages** different types of data potentially represented in a wide diversity of formats on a wide array of media sources*

MMDBMS Characteristics

- **Uniformly query** data represented in different formats
- Query data represented in **diverse media**
- Retrieve media objects from a local storage devices in a smooth, jitter-free manner
- Provide audio visual presentation of a query result
- Deliver presentation to satisfy quality of service requirements

Multimedia equation

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Multimedia = presentation + context

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presentation: sensory, aesthetic part （美学）

Multimedia equation

Multimedia = presentation + context

presentation: sensory, aesthetic part （美学）

context = convergence + information + architecture

- convergence = data +platform + distribution
- information = storage and retrieval
- architecture = compression + components + connectivity

Homework (I)

- Build your own multimedia data-base

- Requirements:
  - –Choosing **1** of the following multimedia combines:
    - image + text, music+image, video + audio
  - –Selecting **>2** domains (or categories):
    - e.g., **sports** v.s. **science**, **carton** v.s. **movie**,
    - e.g., **U2** v.s. 周杰伦 v.s. the **Beatles**, face v.s. no face
  - –Gathering **>50** examples for each domain:
    - Use **google** or **baidu** to search all required data

Homework (I)

- Hand out
  - Deadline: next Friday (**12:00PM, 2008-09-26**)
  - Data format:
    - one main folder (named by **your ID**)
    - two subfolders (named by **chosen domain**)
      - data in the same category should be installed in 1 subfolders
    - **Unique** data file format
      - **.mp3** (music), **.txt** (text document),
      - **.png** (image), **.avi** (video, please use simple codec, <2min per seg)
  - Upload: FTP
    - TBD (will be ftp://10.76.1.1xx)