CMIF:
A Structure for Transportable, Dynamic Multimedia Documents

Dick C.A. Bulterman
Guido van Rossum
Jack Jansen
Dik Winter
Sjoerd Mullender
Lynda Hardman

CWI: Centrum voor Wiskunde en Informatica
Amsterdam
Presentation Outline

• Multimedia: what is it (and why is it interesting)?

• CMIF: CWI’s Multimedia Interchange Format

• Hyperstructures & CMIF: Open Questions
What is Multimedia?

• Present:
  
  **multimedia** <buzzword; adj>: a property of applications software that allows for the mixed use of several (chiefly output) media—such as sound, video, text, image and graphic data—in a manner that makes the unsuspecting user think that something unusual is happening on an otherwise conventional computing system.
  
  Examples: multimedia mail; multimedia documents; multimedia research
  
  See also: Clothes, Emperor’s New.

• Future:
  
  **multimedia** <adj>: a generalized ability of programs and architectures to define, manipulate and present all forms of temporal and spatial information.
  
  Examples: multimedia programs; multimedia computers
  
  See also: Data, Universal.
Distributed Multimedia
General Areas of Interest

• Document Structures for Transportable Presentations
  — document object model
  • inter-object synchronization
  • object presentation model

• User Interaction Models
  — presentation tailoring
  • component placement
  — presentation control
  • component selection
A Typical Multimedia Problem:  
Setting Coffee

• Components:

<table>
<thead>
<tr>
<th>Instructions (text)</th>
<th>Instructions (spoken)</th>
<th>Headline Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>English</td>
<td>Dutch</td>
</tr>
<tr>
<td>Informative</td>
<td>A Useful Film</td>
<td>English</td>
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<tr>
<td>Illustrations</td>
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<td>Helpful</td>
</tr>
<tr>
<td>Personal Tips</td>
<td></td>
<td>Tips</td>
</tr>
</tbody>
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• Problems (presentation):
  — creating data
  — synchronizing components
  — laying out a presentation
  — starting a presentation
  — controlling a presentation

• Problems (support):
  — representing data
  — fetching components
  — resource allocation
  — data/control modelling
  — interactive feedback
The CWI Multimedia Pipeline

document structure mapping tool

constraint filtering tools

document presentation mapping tool

end-user viewing & manipulation

media-specific input tools
CMIF: Transportable Multimedia

• Current Structure Shortcomings:
  — FAX syndrome for audio/video/text data
  — centralized source/sink model
  — lowest-common-platform data modelling

• CMIF Goals:
  — decouple data and structure
  — define transportable documents
  — support heterogeneous environments
  — define flexible synchronization requirements
CMIF and the Multimedia Pipeline

- **CMIF specification**
- **Document structure mapping tool**
- **Document presentation mapping tool**
- **Constraint filtering tools**
- **End-user viewing & manipulation**

**Tools:**
- **Media-specific input tools**
- **Document independent**
- **Target-system independent**
- **Document dependent**
- **Target-system dependent**

**Document mapping tool**

**Target-system independent**

**Target-system dependent**
CMIF Information Tree
Information Modelling in CMIF

channel

data event a

data event b

data event c
Synchronization in CMIF

channel

event a

event b

event c

channel

event A

event B

event C
Hyper-Information and CMIF

- CMIF specification
- Document structure mapping tool
- Document presentation mapping tool
- Constraint filtering tools
- End-user viewing & manipulation

Element selection tool
Open Issues

• Modelling time-based data

• Creating/managing ‘multimedia hyperlinks’?

• Dynamic selection
Modelling Time-Based Data

dcab  abcd  bcad  acdb  cadb  badc
Modelling ‘Multimedia Hyperlinks’
Dynamic Data Selection
Dynamic Feedback Control

document structure mapping tool

document presentation mapping tool

constraint filtering tools

end-user viewing & manipulation

media-specific input tools

element selection tool
Summary

- Creating nice multimedia documents for a one platform is hard

- Creating one multimedia document for multiple platforms is harder

- Adding hyper structure information is very hard (but, luckily, very interesting!)