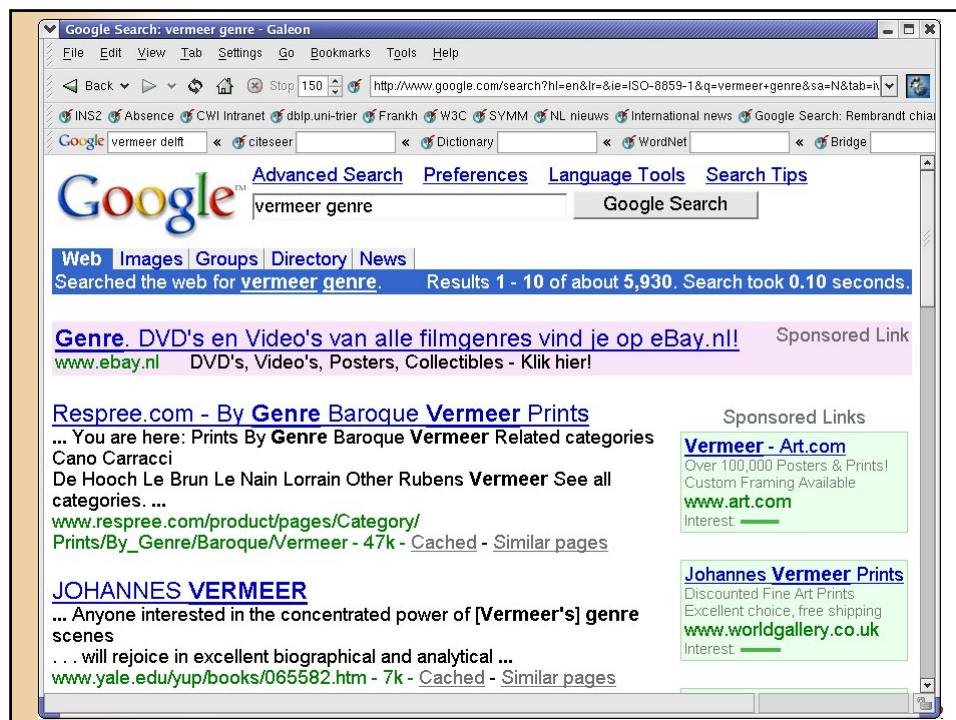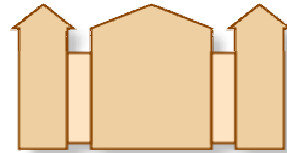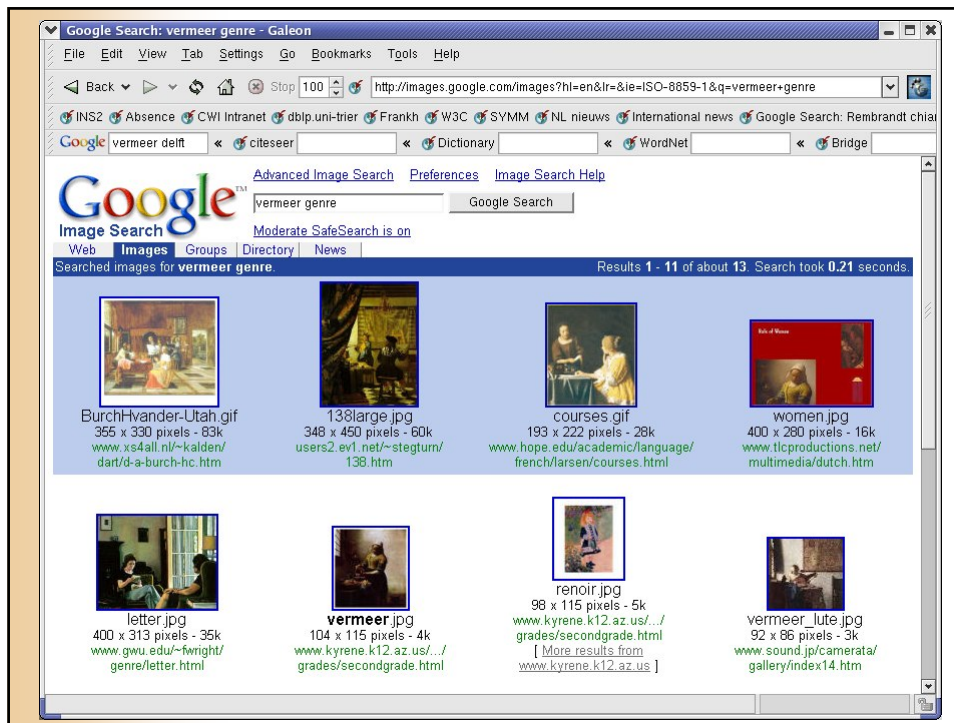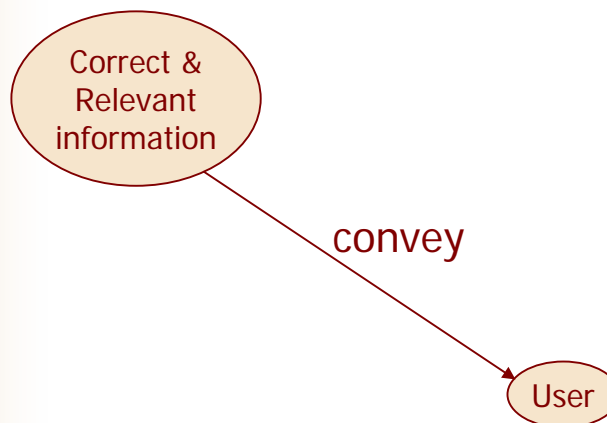# Hypermedia Presentation Generation on the Web

Lynda Hardman

Jacco van Ossenbruggen

CWI Amsterdam

# Presentation Generation

# Tailored presentation
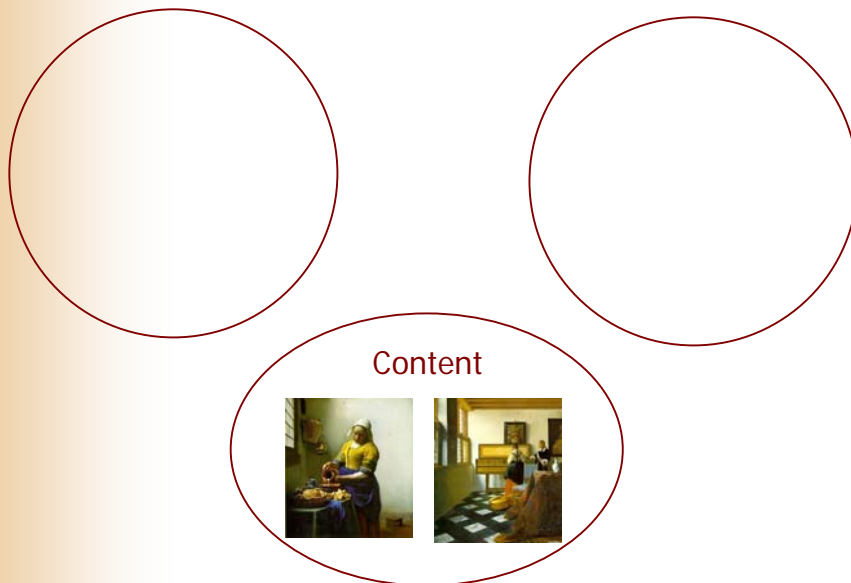


Genre painting and Johannes Vermeer

**Genre**
Genre paintings, drawings or prints depict people in their everyday surroundings: at home, in a café or at work. They appear to be painted from life, but in reality were usually thought up in the artist's studio. Sometimes (but not always!) they contain a moral lesson. In some works the message is clear, in other cases the viewer has to make an effort to interpret the picture. Often, however, these household scenes are simply decorative paintings designed to entertain and amuse.

The Kitchen Maid (c. 1658)

5

# Three ingredients



Content

6

# Content of example

Genre paintings, drawings or prints depict people in their everyday surroundings: at home, in a café or at work. They appear to be painted from life, but in reality were usually thought up in the artist's studio. Sometimes (but not always!) they contain a moral lesson. In some works the message is clear, in other cases the viewer has to make an effort to interpret the picture. Often, however, these household scenes are simply decorative paintings designed to entertain and amuse.

7

# Three ingredients

Presentation structure

Content

8

4

# Presentation structure of example

title — Genre & Vermeer
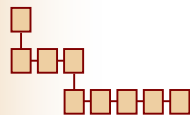
description — examples

Genre paintings, drawings or prints depict people in their everyday surroundings: at home, in a café or at work. They appear to be painted from life, but in reality were usually thought up in the artist's studio. Sometimes (but not always!) they contain a moral lesson. In some works the message is clear, in other cases the viewer has to make an effort to interpret the picture. Often, however, these household scenes are simply decorative paintings designed to entertain and amuse.
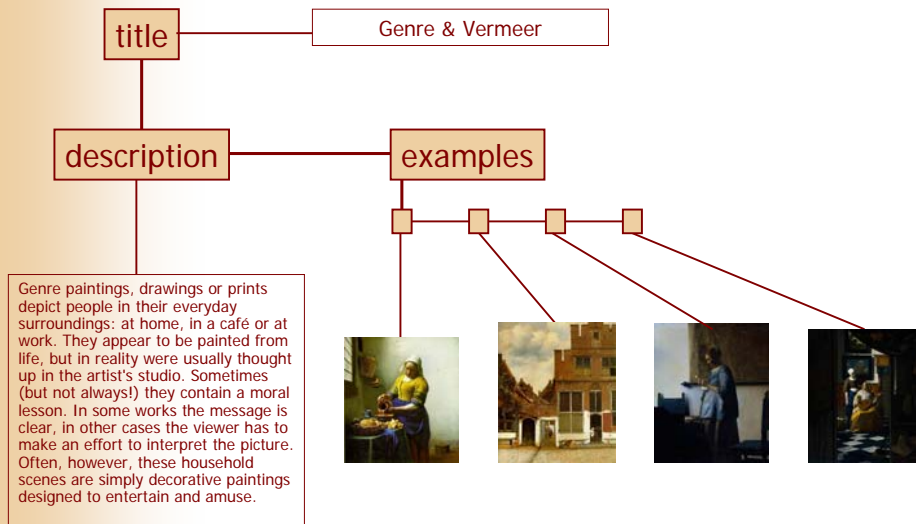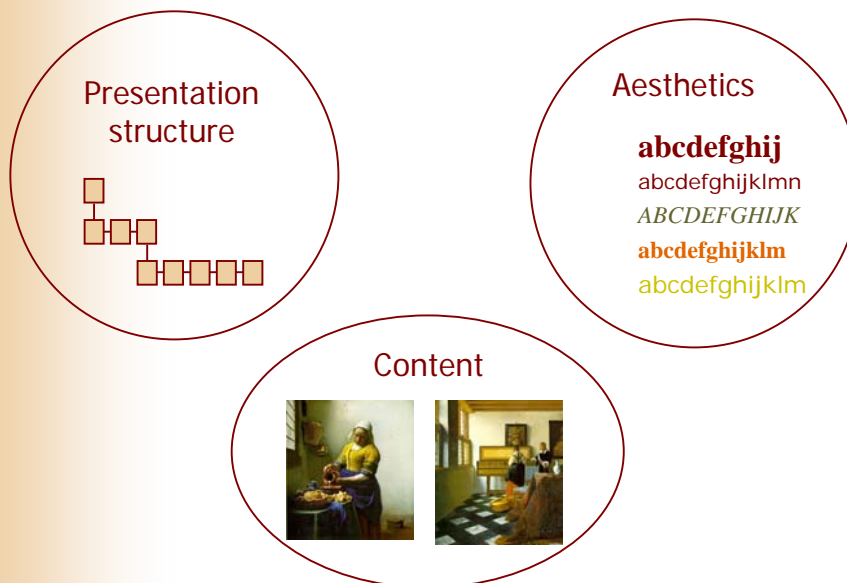
9



# Three ingredients

Presentation structure

Aesthetics

**abcdefghij**
abcdefghijklmn
*ABCDEFGHIJK*
**abcdefghijklm**
abcdefghijklm

Content

10

# Aesthetics of example



Fonts

Layout

Colours

11

# Tailored presentation



12

# One size *doesn't* fit all

# What we need is...

Correct and relevant information

presented to the user
– conveying underlying relations in the subject matter
– at a suitable level of detail
– in the time available to the user
– using appropriate media
– in an appropriate style
– making optimal use of the delivery context

# Create models...

| Need | Knowledge of... |
| --- | --- |
| Convey underlying relations | Domain |
| Suitable level of detail | Discourse |
| Time available to user | User task |
| Appropriate media | Media characteristics |
| Appropriate style | Graphic design |
| Device characteristics | Device capabilities |

15

# Encyclopaedia



16

## Storyteller

Presentation Player

RIJKS MUSEUM amsterdam

Powered by Cuypers

Duration: 3 minutes    Character: Prosaic    Artefact: The Kitchen Maid

Text:    Audio:    Speed:    0   1   2   3

The Kitchen Maid
by Johannes Vermeer
ca 1660
Oil on canvas
45.5 x 41 cm

---

## Create models...

| Need | Knowledge of... |
|---|---|
| Convey underlying relations | Domain |
| Suitable level of detail | Discourse |
| Time available to user | User task |
| Appropriate media | Media characteristics |
| Appropriate style | Graphic design |
| Device characteristics | Device capabilities |

...to drive the creation of presentations

# Design dependencies

**Presentation structure**

**Aesthetics**

**abcdefghij**
abcdefghijk
*ABCDEFGHIJK*
**abcdefghijk**
abcdefghijk
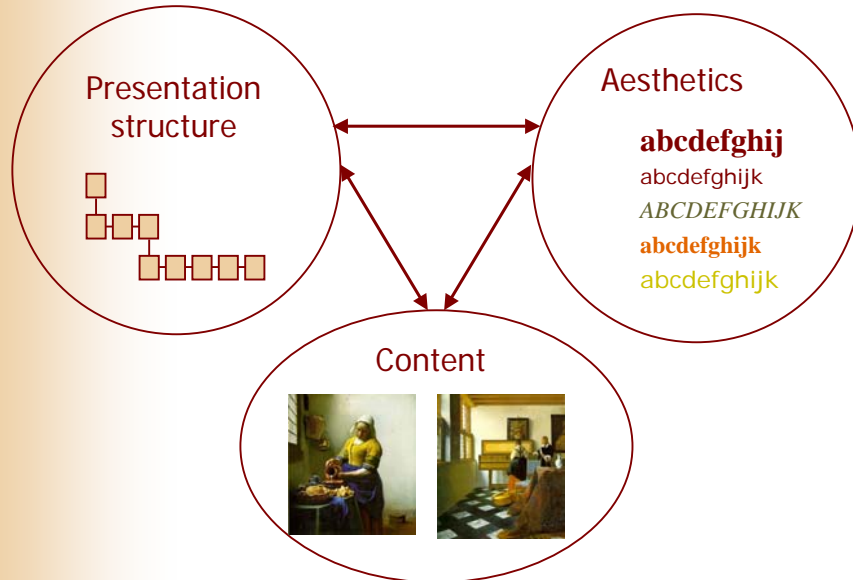
Content

# Presentation structure depends on content

Vermeer

cityscapes

1623

1658

1665

1628

1665

genre
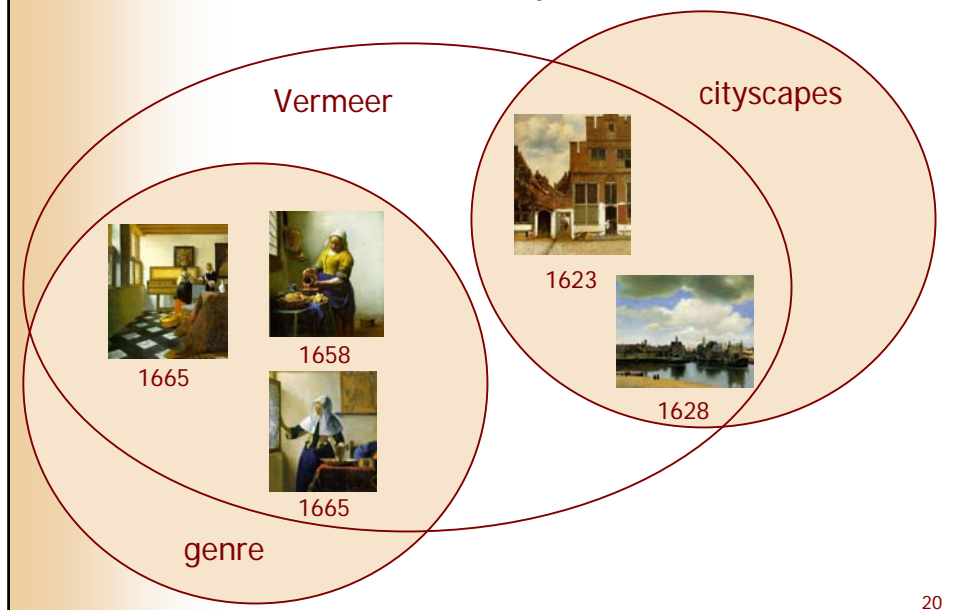
# What is the Web?

A standard means of
- locating information (URI)
- describing documents (HTML, XML)
- transferring documents (HTTP)

# What is Web Multimedia?

A standard means of
- locating media items (URI)
- describing multimedia documents (SMIL)
- including timing (XHTML+TIME, SVG)

# What is the Semantic Web?

A standard means of
- labelling connections (RDF)
  among objects (URI)
- categorising objects and their connections
  (RDF Schema)
- specifying constraints on the connections
  and the objects (OWL)

23

# Cuypers
# multimedia generation engine



User
Query

Cuypers Engine

MM
DB

Meta
data
DB

Demo
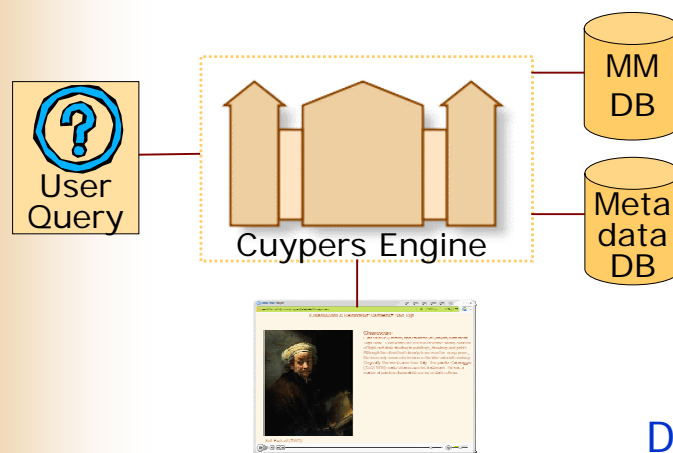
24

# Cuypers Knowledge Sources
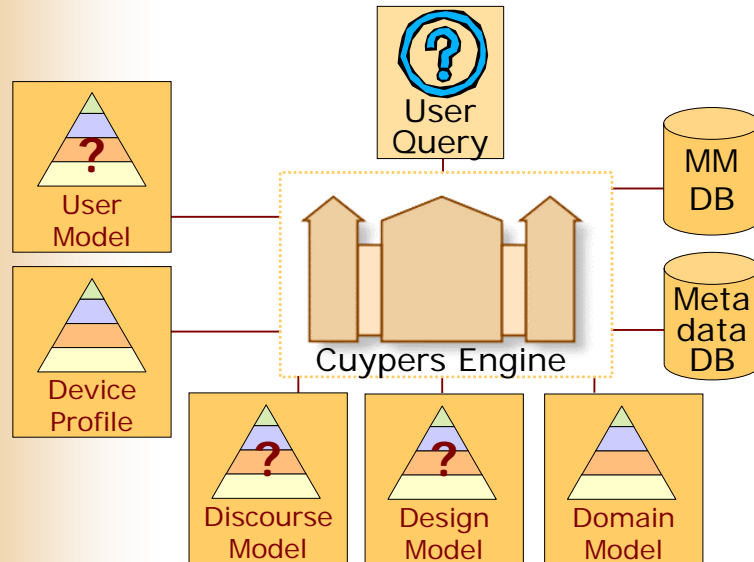
# Example scenario
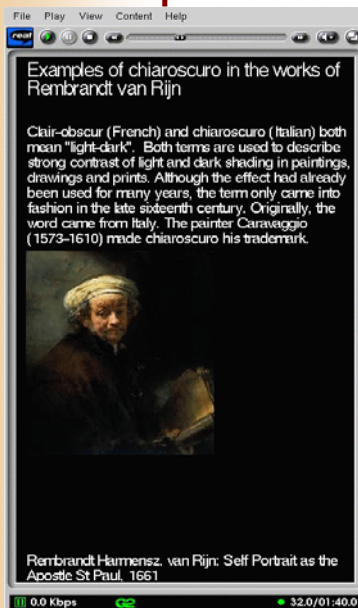


- User is interested in Rembrandt and wants to know about about the "chiaroscuro" technique

- System responds with textual explanation of the technique and a number of example images of its application in Rembrandt's paintings

## Example - Annotated SMIL
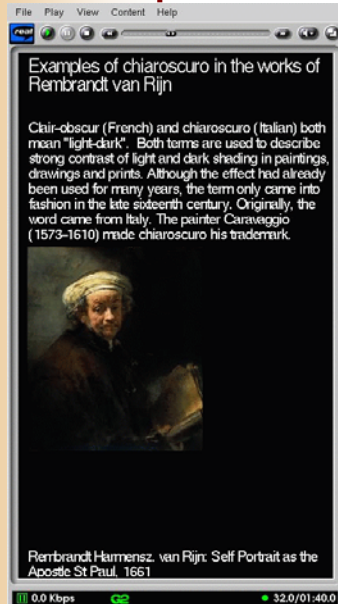
Combine

Content
  text, images
Document structure
  SMIL: timing, layout, links
"Message"
  Rembrandt is-a painter

## Using an existing ontology

```
See http://www.cwi.nl/~media/semantics/
<?xml version="1.0"?>
<!-- taken from
 http://www.ics.forth.gr/proj/isst/RDF/RQL/rql.html
 -->
<rdf:RDF xml:lang="en"
 xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
 xmlns:rdfs="http://www.w3.org/TR/2000/CR-rdf-schema-20000327#"
 xmlns="">

  <rdfs:Class rdf:ID="Artist"/>
  <rdfs:Class rdf:ID="Artifact"/>
  <rdfs:Class rdf:ID="Museum"/>
  <rdfs:Class rdf:ID="Painter">
    <rdfs:subClassOf rdf:resource="#Artist"/>
  </rdfs:Class>
  <rdfs:Class rdf:ID="Painting">
    <rdfs:subClassOf rdf:resource="#Artifact"/>
  </rdfs:Class>
...
</rdf:RDF>
```

# Embedding RDF in SMIL - I

```xml
<smil xmlns="http://www.w3.org/2000/SMIL20/CR">
  <head>
    <meta name="generator" content="CWI/Cuypers 1.0"/>
    <metadata>
      <rdf:RDF xml:lang="en"
               xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
               xmlns:oil="http://www.ontoknowledge.org/oil/…"
               xmlns:museum="http://ics.forth.gr/.../museum.rdf"

        <museum:Museum rdf:ID="Rijksmuseum" />

        <museum:Painter rdf:ID="Rembrandt">
          <museum:fname>Rembrandt</museum:fname>
          <museum:lname>Harmenszoon van Rijn</museum:lname>
          <museum:paints rdf:resource="#apostlePaul" />
        </museum:Painter>

        <museum:Painting rdf:about="#apostlePaul">
          <museum:exhibited rdf:resource="#Rijksmuseum" />
          <museum:technique>chiaroscuro</museum:technique>
        </museum:Painting>
      </rdf:RDF>
    </metadata>
    . . .
```

29

# Embedding RDF in SMIL - II

```xml
<museum:Painting rdf:about="#apostlePaul">
          <museum:exhibited rdf:resource="#Rijksmuseum" />
          <museum:technique>chiaroscuro</museum:technique>
          <token:painted-by rdf:resource="#Rembrandt" />
        </museum:Painting>
      </rdf:RDF>
    </metadata>
...
  </head>
  <body>
    <par>
      <text region="title" src="...query to MM DBMS..."/>
      <text region="descr" src="..."/>
      <seq>
        <par dur="10"> ... 1st painting+title ... </par>
        <par dur="10"> ... 2nd painting+title ... </par>
        <par dur="10"> ... 3rd painting+title ... </par>
        <par dur="10"> ... 4th painting+title ... </par>
        <par dur="10" id="apostlePaul">
          <img  region="img" src="..."/>
          <text region="ptitle" src=".."/>
        </par>
      </seq>
    </par>
  </body>
</smil>
```

30

15

# Marked-up presentation



```
<museum:Painting rdf:about="#apostlePaul">
        <museum:exhibited rdf:resource="#Rijksmuseum"/>
        <museum:technique>chiaroscuro</museum:technique
>
</museum:Painting>
  </rdf:RDF>
  </metadata>
...
  </head>
  <body>
    <par>
      <text region="title" src="..."/>
      <text region="descr" src="..."/>
      <seq>
        <par dur="10"> ... </par>
        <par dur="10"> ... </par>
        <par dur="10"> ... </par>
        <par dur="10"> ... </par>
        <par dur="10" id="apostlePaul">
          <img  region="img" src="..."/>
          <text region="ptitle" src=".."/>
        </par>
      </seq>
    </par>
  </body>
</smil>
```

Text in image panel:

Examples of chiaroscuro in the works of Rembrandt van Rijn

Clair-obscur (French) and chiaroscuro (Italian) both mean "light-dark". Both terms are used to describe strong contrast of light and dark shading in paintings, drawings and prints. Although the effect had already been used for many years, the term only came into fashion in the late sixteenth century. Originally, the word came from Italy. The painter Caravaggio (1573–1610) made chiaroscuro his trademark.

Rembrandt Harmensz. van Rijn: Self Portrait as the Apostle St Paul, 1661

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# Cuypers – the bad news

Currently all our design knowledge is:

• implicit and hidden in the generation rules

• lost in the generated Web presentation

• not reusable for other Web applications/sites

We need the Semantic Web

32

# Topia

# Conclusions

- Generating multimedia presentations requires
  - making design dependencies explicit
  - taking these dependencies into account
- Semantic Web has the potential to
  - encode knowledge we use
  - reuse knowledge already available
- Cuypers and Topia systems
  - provide experimentation platforms
  - using standard tools and languages as much as possible