Interaction Design for the Semantic Web

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One size *doesn’t* fit all

The problem

• Too many users need their own information
  - for their level of expertise
  - using appropriate media
  - in an appropriate style
  - displayed on their own device
• Multimedia information design is expensive
• There has to be some automation in the process
The Context

• Web
  - open and linked
  - is with us now

• Semantic Web
  - open and richly linked
  - is under development
  - particularly for machine processing

• User’s information seeking task

Interaction Design for the SW

• Long term goal to construct hypermedia automatically.
  - What good is that to you?

• You understand interfaces and how to design them by hand.
  - How can machines help us with the details?

• We can capture semantics about information design for re-use.
  - Not there yet.

• We can use information sources available on the SW and make them available to end-users.
  - That’s what much of this week is about.

• Then we need to deal with:
  - Selecting a sub-set (semantic search)
  - Grouping and ordering (linking to extra) for end-user.
    (Start with “data” based structuring and move to discourse based.)

• New functionality
  - relation search
  - include higher level human-oriented communication
  - others?

• And then we need to understand what good new interfaces are.
  - Evaluating an existing interface is relatively easy
Chiaroscuro

Chiaro-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. He was a master at painting illuminated scenes in dark settings.

Three ingredients

Content
Content of example

Figures:

- Caravaggio's painting of a man in a hat.
- Caravaggio's painting of a man reading.

CLAIR-OBSCUR (Frans) en chiaroscuro (Italiaans) betekenen ‘licht-donker’. Beide termen worden gebruikt om sterke licht-donkercontrasten in schilderijen, tekeningen en prenten aan te duiden. Hoewel het effect al eerder werd toegepast, is de term pas sinds het einde van de 16de eeuw in zwang. De oorsprong van het woord ligt in Italië. De schilder Caravaggio (1573-1610) maakte het chiaroscuro-effect tot zijn handelsmerk. Hij was een meester in het schilderen van donkere taferelen met één felle lichtbundel.

Three ingredients

- Presentation structure
- Content
Presentation structure of example


Three ingredients

Presentation structure

Aesthetics

abcdefghij

abcdefghijklmn

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijkl

Content
Aesthetics of example

Design dependencies

Presentation structure

Aesthetics

Content

Colours

Fonts

Layout

abcdefghij

abcdefghijk

abcdefghijk

abcdefghijk

abcdefghijk

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ
Presentation Structure depends on Layout

Style Depends on Content

Chiaroscuro & Rembrandt

*The Stone Bridge (1638)*

Chiaroscuro & Rembrandt

*The Stone Bridge (1638)*
Presentation structure depends on content

Example Presentation Structure
Different presentation styles

• Large amount of information
• High interaction
With such concentration a woman pours milk into a bowl. With her left hand she supports the can she is pouring from. The right arm is outstretched to balance the can against her body. The smile on her face, however, is quite indifferent. The position of her feet, a side view, is a hint as to whether the woman is standing or sitting. The left arm is的支持ing the window so she can see what she is doing. The light falls on her face, her silhouette is stark against the white wall. There is a fascinating play of light and shade in this painting.

Genre
This is one of Johannes Vermeer’s genre pieces in which he establishes an intensely intimate atmosphere. Although the artist observes his model from nearby, she continues with her work, totally unperturbed.

Technique
Vermeer made use of light and perspective to create the intimate atmosphere. All lines of perspective lead to the right hand of the woman. Lines of vision lead to the pouring milk in which she is completely engrossed. The woman leans over her head, so that the viewer seems to look up
Different presentation styles

• Entertainment rather than information
• Low interaction
2. Search by name of artist:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Vermeer, Johannes

“Little Street”, ca 1658
The Kitchen Maid, ca 1660
Woman reading a Letter, 1662-1663
The Love Letter, 1664-1665

All other Artefacts in chronological order:

Soldier and a Laughing Girl, ca 1665
View of Delft, 1660-1665
The Music Lesson, 1662-1664
Woman Building a Balloon, 1666-1676
Young Woman with a Pearl Necklace, 1664

The Kitchen Maid
by Johannes Vermeer
ca 1660
Oil on canvas
45.5 x 41 cm
Flexible interfaces to MM

• Creating multimedia presentations requires
  - understanding message of presentation
  - knowing specifications of use context
  - making design dependencies explicit
  - taking these dependencies into account

• This is what we want to achieve
Information Seeking

**Information seeking** is the process or activity of attempting to obtain information in both human and technological contexts (Wikipedia).

Research on information seeking behaviour:
- Information Foraging Theory (Pirolli, 1999)
- Information Seeking Task (Keller, 2007)
- Behavioral Model of Information Seeking on the Web (Choo, 2000)
- and many others

Information Seeking Tasks

(adapted from Kelly 2007)

- **Fact Finding**
  query with a clear goal, answer either there or not.
  - Simple query:
    “Where was this painting created?”
  - Complex query:
    “Is there any painting from our collection depicting Amsterdam or created by a painter from Amsterdam with width smaller then 50 cm?”
Information Seeking Tasks
(adapted from Kelly 2007)

- **Information Gathering**: collecting information around a particular topic mostly from different sources, has a high level goal, e.g. in order to make decision, write a report, carry out an assignment.

1. **Comparison**: compare differences and similarities between objects or sets of objects.

   A curator needs to make a proposal each year for acquisition or selling some objects for the museum collection. To do this, she needs to make an assessment of the objects in the collection, and compare them with collections from other musea to see what they already have/don’t have and to see whether the museum needs to obtain a specific object to make the collection complete.

   "What kind of middle-east collections do other musea in the Netherlands have? Is there any tribe or region which is not represented in our collection or in the collection of other musea? If there is, we need to find out exactly what kind of object we should get."

2. **Relationship**: find relationships between people and things. Interesting relationships may be direct or indirect, through several links.

   A curator needs to do research about the people around Rembrandt van Rijn. To do this, the curator does a literature search on close and distant family members of the artist, people who he painted - mostly rich and influential people, people who he met and was friends with. The questions about these people are the same:

   "Who is this person, what does s/he do and what is the nature of his/her relationship with Rembrandt?"
Information Seeking Tasks
(adapted from Kelly 2007)

3. **Topic:**
gather information about a topic, e.g. “Tell me more about X”.

A curator wants to find the story behind every object in the collection. Among the objects is a Jewish ceremonial coat. The curator needs to find out the history of the coat. The curator checks the literature, newspaper archives and auction records.

“Where and when was the coat made?
Was there any restoration done to the coat?
What is the purpose of the coat? What does it symbolize?
Is there any meaning behind the embroidery?
Where was it used? Who used it?
Was it used at an important event?”

4. **Combination:** find a match between two pieces of information, most likely from different sources. This task is similar to putting pieces of a puzzle together to get answers.

A new part of a public building needs to be decorated. An art adviser first gathers the requirements for the public-art, such as the amount of space, the preference of the client, the purpose of the building, the theme of the art and the environment. The next step is to search for all public-art artists, and their portfolio containing examples of their work. The next step is to match the collected requirements with an appropriate artist. The art advisor needs to make a selection of several artists who are suited to the job and then present these options to the client for approval.

“Which public art artists match the project requirements?”
5. **Exploration**: Also known as exploratory search. The nature of the search is exploratory, after following one trail of idea after another, the researcher may unexpectedly find another new idea.

An example is when an expert is looking for examples of artworks for use in staircase projects. Artists do not specialise in staircase art. Rather, the expert looks for related projects for suggestions, such as artists who do landscaping or city planning art projects.

“. . .In specific situations, (such as) in the Staircase project, I look a lot at similar examples of artworks in staircases, for instance, art projects connected to landscaping or city planning, something like that.”

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- **Keep up-to-date**: not goal driven. The motivation is to “see what is new”, “keep up-to-date” or even “waste time”
  - Active: e.g. browsing on news website
  - Passive: e.g. subscribing to news website RSS feed
Literature tips 1

- Roger T. Pédaudque
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  WWW 10, Hong Kong pp. 457-466, ACM Press, May 1-5, 2001
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Literature tips 2

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  http://www.cwi.nl/~media/Theses/Bocconi/VoxPopuli.pdf