Web Design Method:

IDM – Interactive Dialogue Model

- Introduction
- C-IDM

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Outline

- A model for conceptual design: what and why
- IDM at a glance
  - A "dialogic" approach
  - Multiple design dimentions /Multiple submodels
    - C-IDM : Conceptual (Content) IDM
    - L-IDM: Logic/Navigation IDM
    - P-IDM: Page IDM
- C-IDM
  - Primitives
  - Notations
  - Examples
- Esercises

A design model: What

- A design model is a language to describe design decision
- It provides a set of concepts, terms, and notation, and rules to use them
- Example of design languages: ER

An application design model should be…

- Easy to learn for designers and other stakeholders
- Easy to teach
- Usable
- Lightweight in documentation
- Offering few concepts to master the complexity
- Effective for brainstorming ideas
- Directly related to the requirements of the application

An application design model: why?

When designing an interactive multimedia application, a model (a language) can help to

- externalize
- give shape to design ideas and decisions
- communicate and share them
- support (team) brainstorming
- Stimulare discussion
- Stimulate reflection on requirements
- …

IDM approach

- IDM = Interactive Dialogue Model)
  - Joint effort by TEC-Lab (University of Lugano) and HOC LAB(Politecnico di Milano)
  - IDM is of the mature results of a number of previous models
    - HDM – Hypermedia Design Model (first published as „Garzotto F., Paolini P., Schwabe D. HDM- A *Model for the Design of Hypertext Applications.* **Proc. ACM Hypertext '91**, S. Antonio (TX, USA), **ACM Press**, Dec. 1991

IDM Approach: Dialogic

A user's web experience is a human/application is a **dialogue**

Designing a web application means designing the human/application **dialogue**

IDM Approach: Which kind of dialogue?

Linguistics has identified three main types of dialogues:

- **Informative**: the goal is to acquire/communicate information
- **Argumentative**: the goal is to convey a specific meaning to influence attitude or behavior
- **Operational:** focused on "what to do" and "how to do"

IDM Focus

IDM Focus:

- Informative – Argumentative Dialogue
- QUESTIONS-ANSWERS
  - Asymmetric: main information provided by the application; user maily "**asks** for" something (by **selecting a link**)

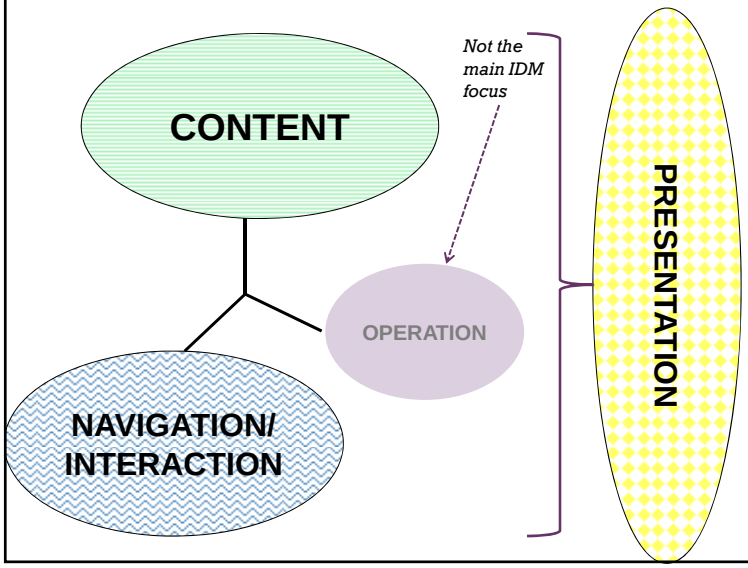
Example

- Consider a web site, e.g.:
  http://www.nga.gov/
  Focusing on "Collection"
  http://www.nga.gov/collection/index.shtm
- Describe the dialogue, i.e., define the user's questions in some pages
  http://www.nga.gov/collection/gallery/gg4/gg4-41581.html

IDM Approach: Dialogic

- Each use of the application makes a „dialogue" happen
- The application is a „dialogue generator"
  - It makes dialogues happen
  - it serves for the actualization of a (large, but limited) number of possible dialogues
- Design means defining the rules for effective dialogues to take place
- The user can interact within the boundaries set by the dialogue designer
- Dialogues should be conceived and structured, before detailing the technological architecture needed
- Dialogues are, in general, depending on the „channel", i.e., the device used and the context of the dialogue

Traditional Design Dimensions and the IDM approach



Traditional Design Dimensions and the IDM approach

Design Dimensions	Dialogue metaphors	IDM submodels
Content Design	Designing what can be said (what is the dialogue about)	C-IDM (content or conceptual IDM)
Navigation/ Interaction Design	Designing the actual **flow of dialogue** (how to move from one topic to another one)	L-IDM (Logical IDM)
Presentation Design	Designing the "form" of the dialogue structures	P-IDM (Presentation of Page IDM)

Design example for the following slides

- **Website and PDA multimedia guide** for an temporary exhibition **of** Edvard Munch's prints**, hosted at the State Museum in Berlin.**
  - demonstrative application developed within the HELP project (EU-funded, programme CULTURE, 2003)
- The website mainly aims at presenting the temporary exhibition (to be used before and after the visit, at home or at the musuem entrance)
- The PDA mainly aims at supporting the user during on-site visit.

www.munchundberlin.org


Edvard Munch
12 April - 13 July 2003 Kupferstichkabinett Berlin
Listen to this web site
The Sick Child (Sick Girl)
Year: 1894
Size: 36,1 X 26,9 cm
Collection: Berliner Kupferstichkabinett
Technique: Drypoint, roulette and burnishing on copperplate
Theme: Sickness and Death
Description
The drawing "The sick child" is divided into two areas. The larger area shows a woman and a girl in a room. Both of them are dressed in black. The girl is sitting on a chair which stands parallel to the right edge of the drawing. The back of the chair is nearly completely covered by a large white cushion. The face and the upper part of the girl's body are turned towards the woman, who is sitting on her left with her head bowed. Her dark hair is tied up in a soft knot. Her head is resting on the cushion. The right hand is resting on the right arm of the girl. The right arm of the girl is bent and is resting in front of her body on a light blanket covering her legs. To the right of the chair, on the edge of the painting, there is a small wooden chest of
You are browsing the "Selected Masterpieces".
Up to masterpieces
Just visited
Visited and Missing
My history in the site
previous
Print
1/15
next
Exhibition


Internet Explorer
7:19
http://192.168.0.5:8080/munchPD
Welcome to the Exhibition
Edvard Munch
The graphics at Kupferstichkabinett Berlin
All Prints
Masterpieces
Tematic Tour
My Tour
Preferences
Cart
Munch Museum Exhibition Events Credits
View Tools
Internet Explorer
7:30
http://192.168.0.5:8080/munchPD
Edvard Munch
"The graphics at Kupferstichkabinett Berlin"
Masterpieces
Please go to...
ROOM 4
View Tools

What is C-IDM about

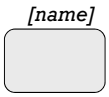
- What should be said?
- What are the relevant changes of subjects to be supported?
- What are the possible different ways to organize the dialogue subjects

These decisions should be taken during conceptual design or content design (supported by C-IDM primitives)

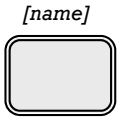
Basic primitives of C-IDM

Design Issue	C-IDM primitive
What should be said?	Topic Kind of Topic (sometimes called "Multiple Topic")
What are the relevant changes of subjects to be supported?	Relevant relation (class)
How to organize the dialogue?	Group of topics Multiple group of topics

IDM – Graphic notation

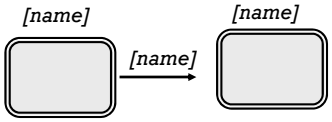


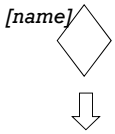
Topic (T)



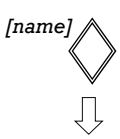
Kind of Topic or Multiple Topic (MP))

Relevant Relation (RR)





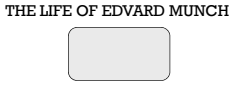
Group of Topics (GOT): the arrow points to the kind topics that are grouped



Multiple (parametric) group of topic - MGOT
(the arrow points to the kind topics that are grouped)

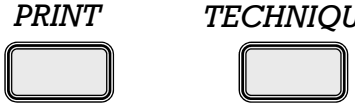
Topic

- Something that can be the subject of conversation between the user and the interactive application
  - Something of interest for the user, about which (s)he can ask questions
  - What the application can speak about
- Examples
- "THE SICK AN THE CHILD" (a print by Munch)
- "DRYPOINT" (a technique for prints)
- "THE LIFE OF EDVARD MUNCH"



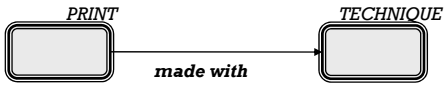
Multiple topic or Kind of Topics

- A category of possible subjects of conversation
- E.g.
  - "PRINT "is a Kind of Topic
    - "The sick child" - a Topic - example or INTANCE of -"PRINT "
  - "TECHNIQUE" is a Kind of Topic
    - "DRYPOINT" is a Topic - example or INTANCE of "TECHNIQUE"



Relevant Relation (Class)

- It models changes of subject, i.e., shifts of conversation topics
- It determines how the dialogue can switch from topics of a given kind to topics of other kind(s) that have some domain dependent relationship
- Example
  - "made with" is a possible change of subject from a PRINT to the TECHNIQUE used for it



Relevant relationship are typically symmetric, i.e., for each relevant relationshipo there is an inverse one (e.g., TECHNIQUE "used for" PRINTS

Defining Relevant Relationships

An OPPORTUNISTIC model of the information space of interest for the user

Web design is NOT knowledge representation: you do not model "the world" (for inference purposes, e.g., in AI) but only what is interesting for the user experience

Depending on the domain:

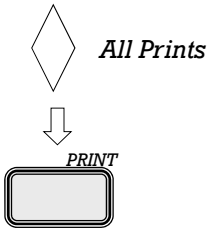
- More than one relevant relationships can be defined among two kind of topics
  - E.g., Artworks can be related to Painters becaouse "are painteb by" or "have inspired"
- A relevant relationship can relate topics of the same kind
  - (e.g., Artworks can "inspire", or "be located close to", other Artworks
- In general, relevant relationships are estalished among topics, seldom among topics and groups of topics

+ Group of topic

- A set of possible subjects (Topics) of conversation

  What are they useful for:

  - Starting points for the dialogue
  - Inviting, guiding, intriguing and capturing the user during the dialogue with the application
  - Helping to understand what the application is about
  - Helping to locate and access the content



- Examples
  - **Top-10 MASTERPIECES**
  - **ALL PRINTS**

+ Groups of topics

They can be of different nature:

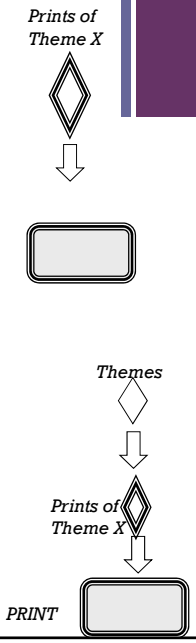
- oriented to content, and based on objective or subjective criteria, e.g. :
  - "All prints created using Drypoint technique" (objective)
  - "The museum's curator favourite prints" (subjective)
- Orientated to user's activities, e.g.
  - In a food web site: "Food for a romantic dinner" "Food for Christmas Eve"…
- Orientated to user's profile, e.g.
  - In a university web site: "All courses for bachelor students" "All PhD seminars"
- Orientated to highlight some topics of interest for the web site client, e.g., for marketing purposed
  - In an e-commerce web site"This week undercost products"

+ **Multiple** (parametric)group of topics

- Determines a **family** of group of topics
  - E.g.: "prints on a theme X"
- All groups in the family share a set of characteristics, but differ for at least one "parameter X": There is one group **for each** value of the parameter X

IMPORTANT!

- *Each multiple group of topics has a corresponding "higher-level" group of topics*
  - E.g.: "Themes-The groups of all groups of prints for the various themes"
- The high level group allows to select the specific group of topics of interest in the family (e.g.: "Prints about theme "sickness"),



+ Multiple groups of topics

- Examples : a online book store
  - Books of genre X:
    - X = Triller (GOT)
      - Triller 1 (Topic)
      - Triller 2 (Topic)
      - …
    - X = Novel (GOT)
      - Novel 1 (Topic)
      - Novel 2 (Topic)
      - …
    - …

MGOT = "Genres" (All groups of books of a given genre, e.g., Triller, Novel, Fantasy, …)

CARDINALITY

- Cardinality = size of a set (mathematical definition)
- Our definition:

  cardinality = **expected (minimum and max) number of instances**
- **Cardinality must be associated to**
  - Multiple topics
  - Relevant relationships
  - Multiple group of topics

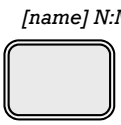
CARDINALITY

Notation similar to ER model: [X:Y] or [X,Y] where

- X = min (meaning "at least, e.g., in the first delivery of the web site");
- Y= max (meaning "at most – we do not expect more than this")

- In a preliminary design, Y can be "unknown" and indicated by a generic letter (e.g., N) to mean: more than 1, not known for the moment
- For relevant relationships
- X can be "0" to indicate an "optional relationship"
- As in ER, [1,N] means "at least one, in general more than one"

Adding cardinality: Notation



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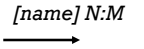
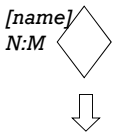


Relevant Relation (RR)



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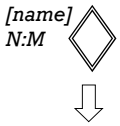


Multiple (parametric) group of topic

CARDINALITY: WHY?

- To plan the overal size of the application
- To estimate the editorial effort
- Plan the content production resources
- To guide the definition of (multiple) groups of topics
  - E.g. If the cardinality of a kind of topic T is very large, we should design several groups to organize the dialogue around them; if the cardinality is very small, perhaps one group "All topics of kind T" is enough
- To guide the definition of navigation patterns in L-IDM
- To set contraints and requirements on lay-out
  - E.g., menus, lists display etc.

DOCUMENTATION: How to represent the above concepts for a specific application?

- Diagram (called **C-IDM Schema)**

integrated with

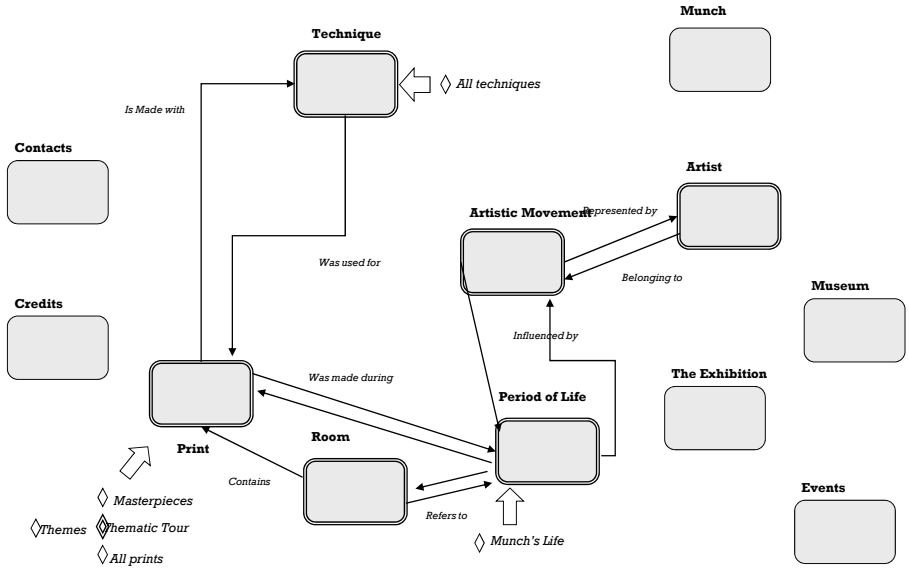
- **Textual descriptions and comments**

EXAMPLE in our case study

Munch und Berlin exhibition – www.munchundberlin.org

C-IDM _schema (cardinality missing: add it as an exercise)

Munch und Berlin exhibition – www.munchundberlin.org



+ Textual documentation

Each element that have a non obvious semnatics should be described **shortly**:

- **Name** : meaningful very short descriptior
- (For semantic relationships, kind of topics, (multiple) groups of topics): **cardinality**
- **Description**: what the element is about
- (for groups of topics and multiple groups of topics): **selection criteria** (how to select the members of the group(s)
- **Motivation/ Role**: why to include this element in your design
- **Examples** (not for single Topic): some example of instances (or group members)

Examples of (partial) textual descriptions

(comments in italics)

Topics:

- EXHIBITION: *an introduction to the exhibition*
- MUNCH: *a brief introduction to Edvard Munch*
- CONTACT US: *relevant contacts for this web site*

Kinds Of Topic:

- PRINT: *the description of a print of the exhibition*
- PERIOD OF LIFE: *the description of a specific period of Munch's life*
- ARTIST: *the description of an artist, living during Munch's time*
- ARTISTIC MOVEMENT: *the description of a relevant artistic movement that may have influenced Munch*
- TECHNIQUE: *description of a technique used by Munch for his prints*

Examples of (partial) textual descriptions

RELEVANT RELATIONS

CREATED IN: print →period of life; *if a print is the subject, you can switch to the corresponding period of life*

MADE WITH: print → technique; *if a print is the subject, you can switch to the corresponding technique*

HAS BEEN USED FOR: technique → prints; *if a technique is the subject, you can switch to the prints made with it*

CONTEMPORARY: period of life → artistic movement; *if a period of life is the subject, you can switch to the artistic movements active at the same time*

ACTIVE IN: artistic movement → artist; *if an artistic movement is the subject, you can switch to the artists being part of it*

Examples of (partial) textual descriptions

GROUPS OF TOPICS:

MASTERPIECES: *those prints that the curator consider the most representatives of the exhibition*

ALL PRINTS: *the complete set of the prints in the exhibition*

TECHNIQUES: *the complete set of techniques used by Munch*

MUNCH'S LIFE: *the complete set of periods of life of Munch*

MULTIPLE GROUPS OF TOPICS:

- **PRINTS OF THE SAME THEME T**: *the set of prints of theme T*

Conceptual IDM – wrap up

- **Topic** (e.g. Munch's life)
- **Multiple topic** or **Kind of Topic** (e.g. an artwork)
- **Relevant relation** (or topic shift, e.g. artwork MADE BY Munch)
- **Group of topic** (e.g. Artworks of the theme "Landscapes")
- **Multiple group of topic** (e.g. artworks of theme "X")
- **Cardinality** associated to multiple topics, multiple groups of topics, and relevant relationships

Advanced Issues: Nested MOTs

- What is Topics can be modeled along multiple parameters, e.g. in a online book store "By genre (thriller, novel, fantasy) and by area (US, Europe, Japan, China, Africa, …)"
- Multiple **groups of topics**, one for each possible combination of parameters
- But… What about **multiple groups of topics**?

Advanced Issues: Nested MOTs

SOLUTION 1: **N sets of** "nested" multiple groups of topics (MOTs) one for each parameter (levels of nesting **N+1**)

Example: N= 2 (genre, area); 2 sets, levels of nesting= 3

Set 1:

- Top level MOT "Genres for all Areas" grouping "level 2" MOTS
- Level 2 MOTs: genre X= specific value **g** (e.g., Thriller); Area: A (parameter); each level 2 MOT (**g**, A) collects GOTs for a specific genre **g**, but for multiple areas A;
- Lower level groups – GOTs – are NOT parametric and finally collect books of that specific genre **g** and in a specific area
- Set 2: similar, starting from Area

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- Lower level groups – GOTs – are NOT parametric and finally collect books of that specific genre **g** and in a specific area
- Set 2: similar, starting from setting the Area parameter

Advanced Issues: Nested MOTs

SOLUTION 2:

1 multiple group of topics (MOT) grouping all **groups of topics**, one for each possible combination of parameters

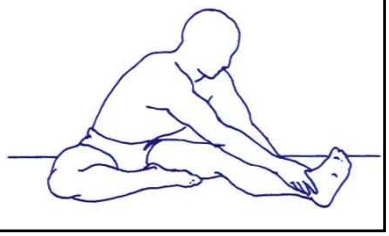
UX design issues – how to specify the values of all parameters **simoultaneously** to select the proper group is posponed to presentation design

Example: MOT "Available Book Genres and Areas" – here all genres and areas are available to the user - grouping Gots NON parametric, that collect all books of a specific genre and a specific area

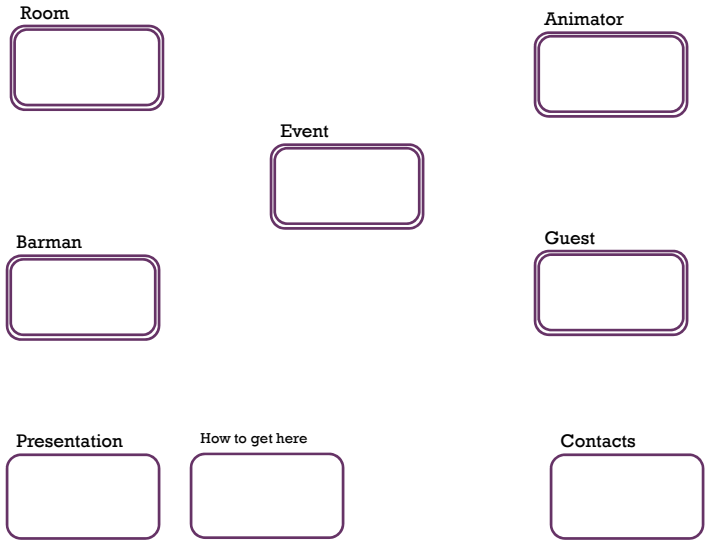
Note that solution 1 and 2 can be combined in case of >2 parameters

Exercise C-IDM

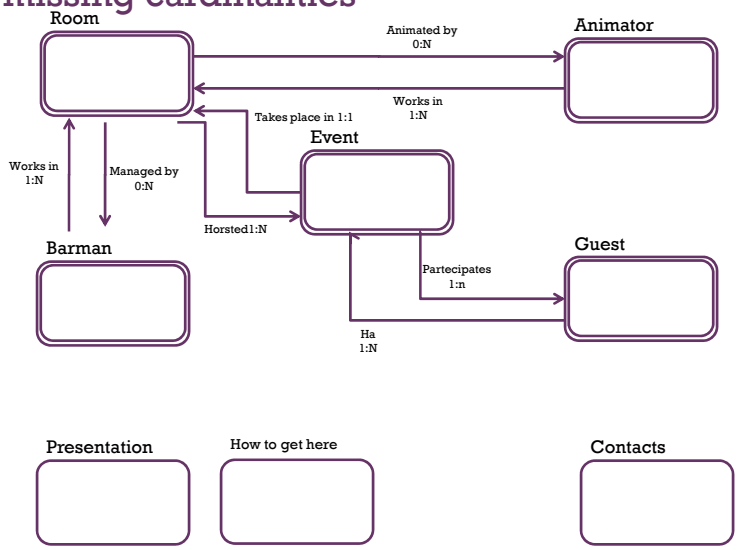
- Imagine a web site for a disco-pub, which aims at promoting its activitity providing information about the place and the events organized there. In the pub there are several **rooms** where you can have a drink and where live **events** (e.g., concerts) are organized. In the pub several **staff** people work, playing several roles (**barman**, **animators, DJs)**. During event, **guest stars** can be invited (e.g., singers, top models, movie actors, …)



Possible solution (1)



Possible solution (2)-complete with missing cardinalities



Possible solution (3))-complete with missing cardinalities