

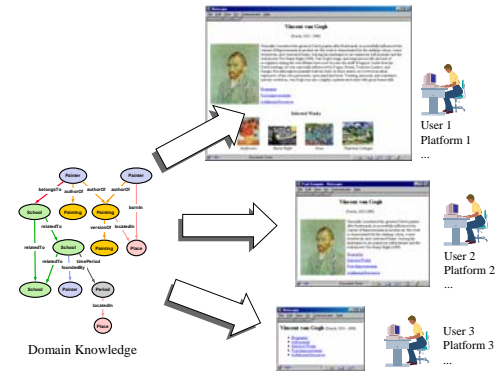
# Context-Sensitive User Interface Support for Ontology-Based Web Applications

Pablo Castells and José A. Macías  
 Universidad Autónoma de Madrid, Spain  
 {pablo.castells, j.macias}@uam.es  
 http://www.ii.uam.es/~castells/pegasus

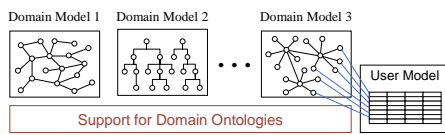
## 1. Ontology-based User Interfaces

- How users visualize / interact with the Semantic Web
  - Annotated (static or dynamic) HTML pages, HTML forms
  - Ontology editors (e.g. Protégé, OilEd)
  - Custom standalone clients (e.g. Java Swing (+ HTTP) + RDF API)
  - ...
- Our focus: dynamic generation of web pages from ontology-based semantic networks
- Current technology for dynamic web page generation is not suited for ontology-based knowledge
  - XSL, JSP/ASP, CGI/Servlets alone require advanced programming skills
  - Adaptive Hypermedia Systems provide canned user interface solutions
- Our approach: take advantage of extra semantic information in the Semantic Web
  - Explicit knowledge classification and structure
  - Information about users, services, platform...

## 2. Context-Sensitive Web Pages



## 3. Our Approach



- Made to measure Ontologies
  - Class hierarchies, attributes and relations
- Domain Model
  - Semantic networks of ontology instances
- Explicit Presentation Model
  - Associate presentations to ontology terms

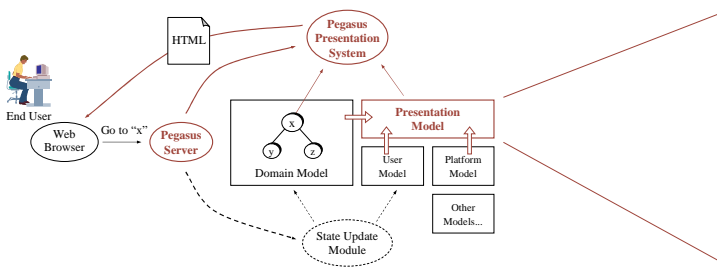
### Better user experience

- Automatic adaptation of the user interface
  - Content selection
  - Type of presentation components, layout & style
  - Link generation & annotation
- Conditions for adaption
  - User model: static profile, action history, state of knowledge, goals
  - Type, structure, and properties of knowledge
  - Platform characteristics: screen resolution, network bandwidth, I/O devices

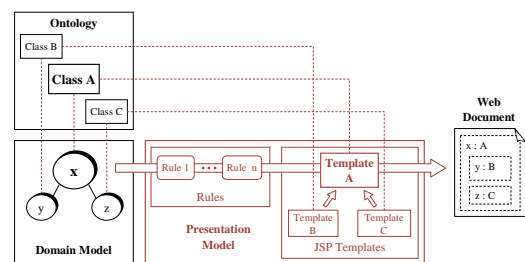
### Support for designers

- Semi-automated web page generation
- Free knowledge representation
- Exploit available Semantic Web metaknowledge
- Retain control over presentation design
- Presentation consistency and reuse
- Interactive authoring tools

## 4. The Interaction Cycle



## 5. The Presentation System



## 6. An Example

Ontology Instance (class Painter)

```
<Painter id="vangogh" name="Vincent van Gogh"
  birth="1853" death="1890" nationality="Dutch">
  <school> <ArtisticStyle ref="postimpressionism"/> </school>
  <picture>
    <AtomicFragment url="vangogh-picture.jpg"/>
  </picture>
  <shortIntro>
    <AtomicFragment> Generally considered the greatest
    Dutch painter after Rembrandt... </AtomicFragment>
  </shortIntro>
  <biography> <AtomicFragment url="vangogh-bio.html"/> </biography>
  <works>
    <Artwork ref="starrynight"/>
    <Artwork ref="sunflowers1"/>
    <Artwork ref="irises"/>
  </works>
</Painter>
```

+

Presentation Model (class Painter)

```
<center>
<h2> <%= name %> </h2>
<%= nationality %>, <%= birth %> - <%= death %> <br>
</center><br>
<center><table>
<tr><td valign="top" rowspan="5"> <%= picture %> </td>
<td align="top"> <%= shortIntro %> </td></tr>
<tr><td <%= biography %> </td></tr>
<tr><td <%= school %> </td></tr>
</table>
<br>
<b> Selected Works </b>
<table><tr><td <%= works %> </td></tr></table>
</center>
```

→

Resulting Web Page