

Mobile and Context-aware Interactive Systems



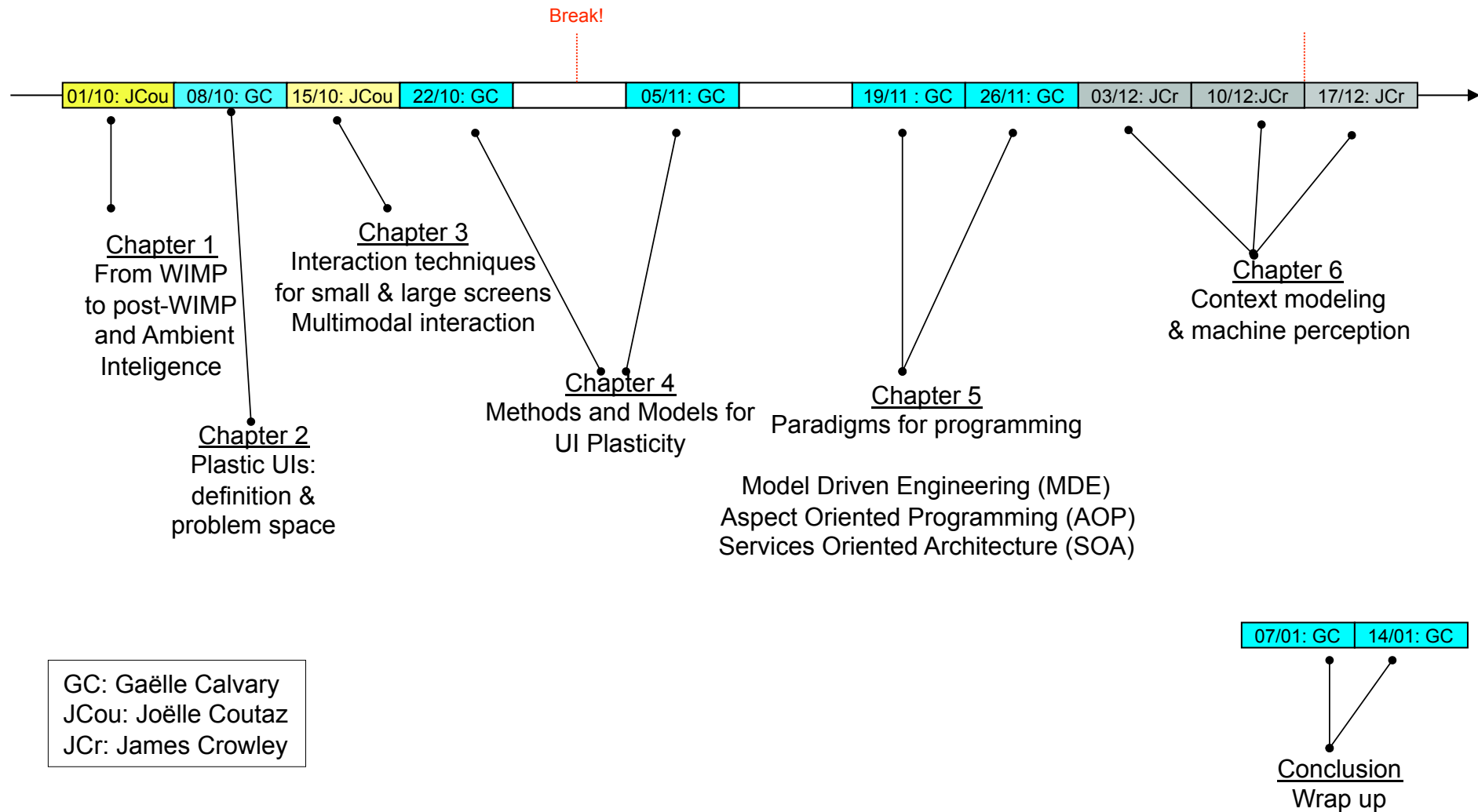
Gaëlle Calvary, Joëlle Coutaz and James Crowley

Université Joseph Fourier (Grenoble I)
Ensimag (INP Grenoble)

Laboratoire d'Informatique de Grenoble (LIG)



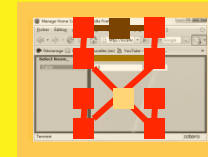
Outline and schedule



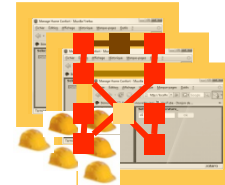
- Model Driven Engineering and **megamodel**



- **Megamodel** and system:
malleability of UIs



- **Megamodel** and development:
mega-UI



- **Megamodel** and domain:
cartography

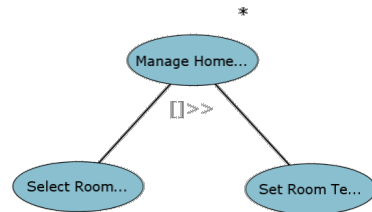


- Conclusion

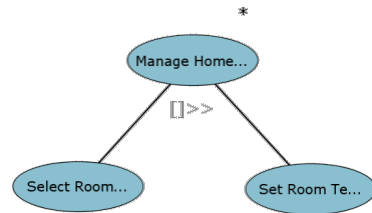




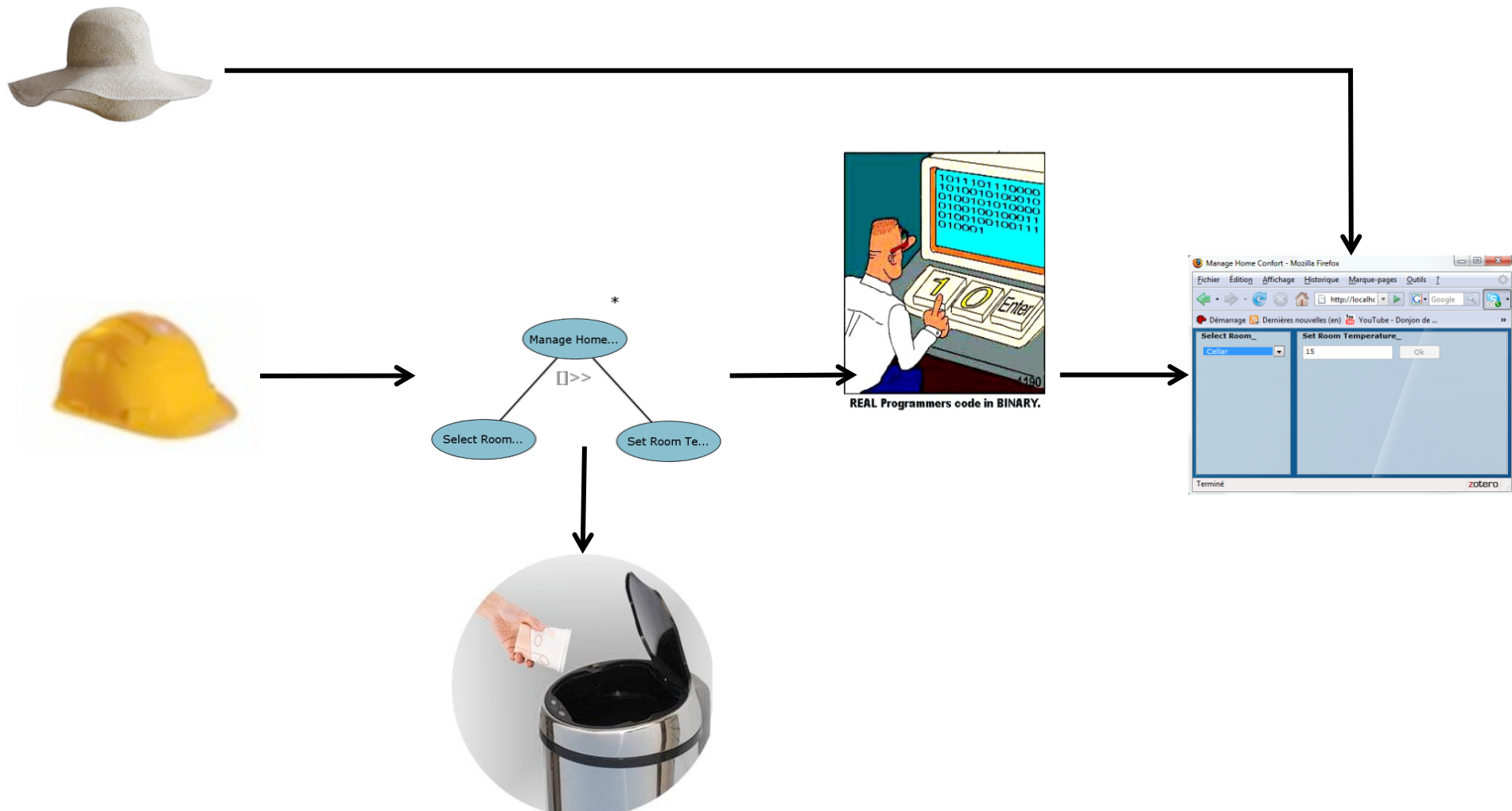
From tailored to malleable UIs



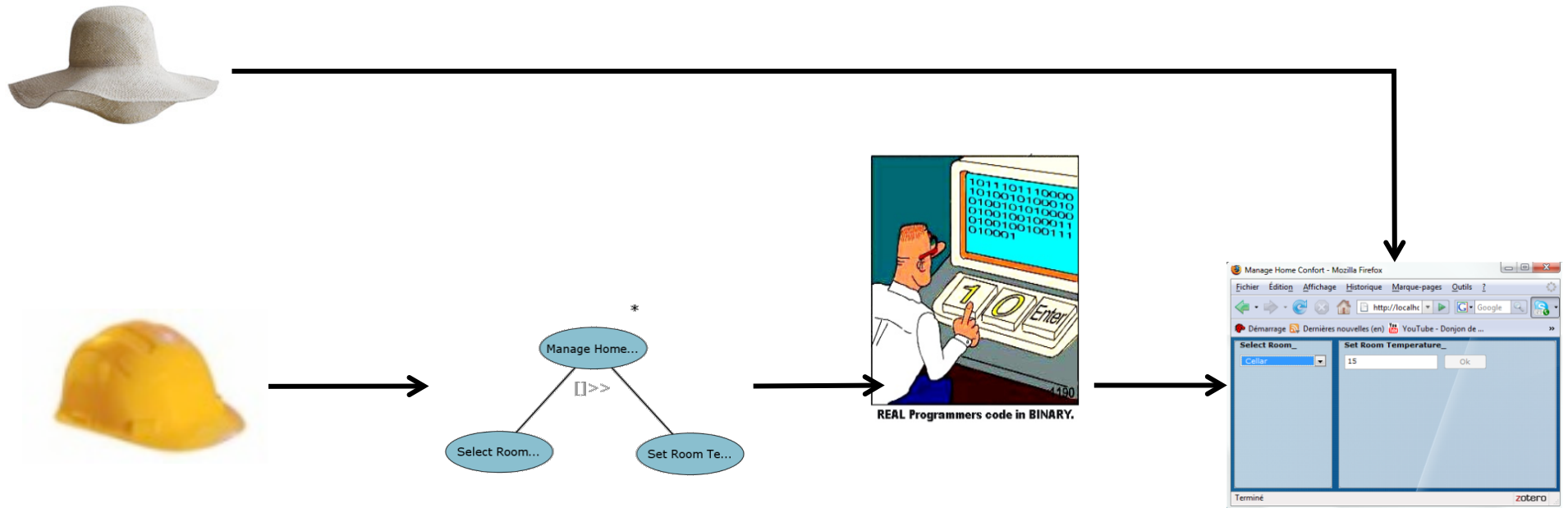
From tailored to malleable UIs



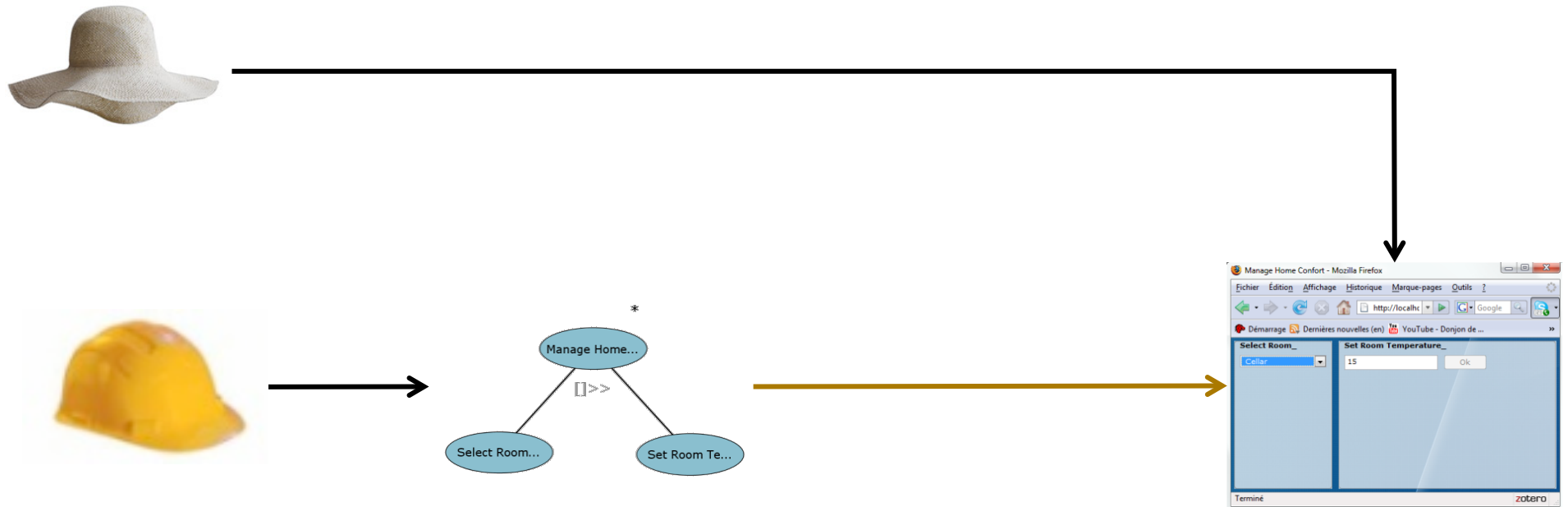
From tailored to malleable UIs



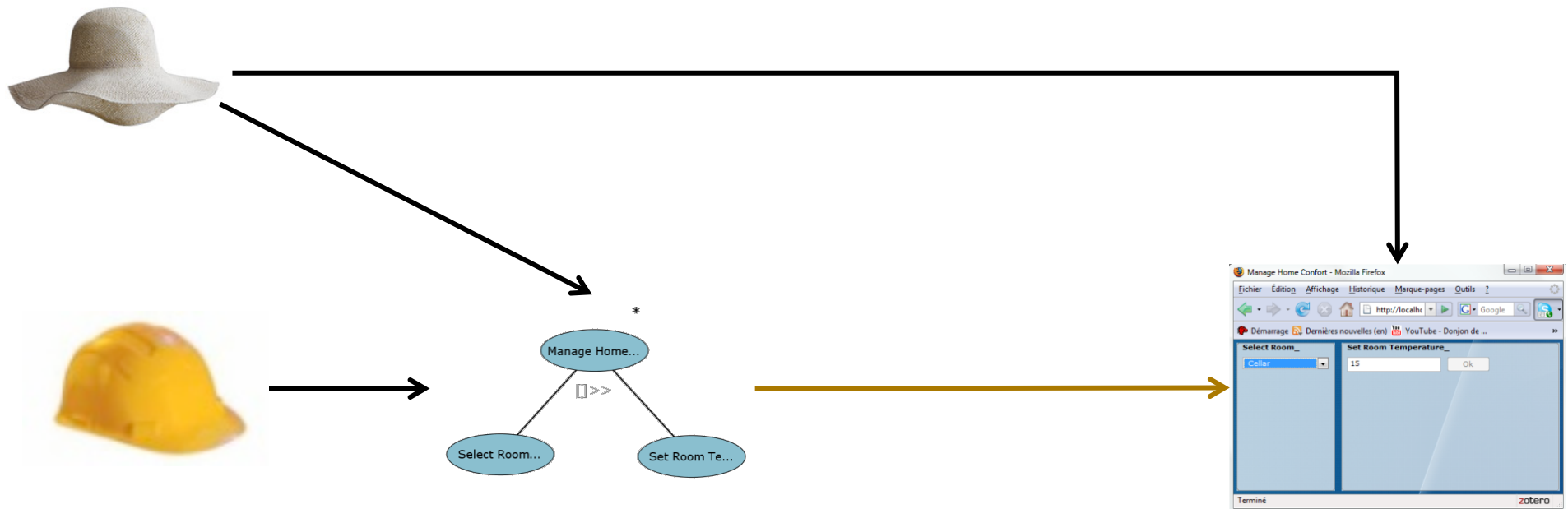
From tailored to malleable UIs



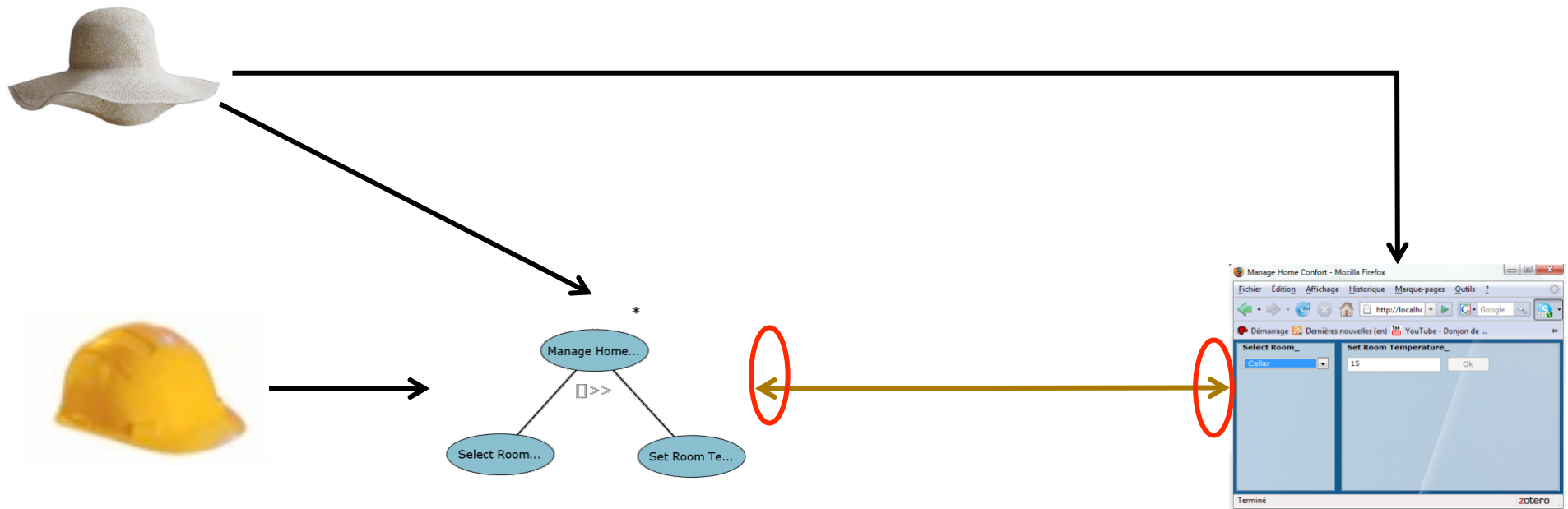
From tailored to malleable UIs



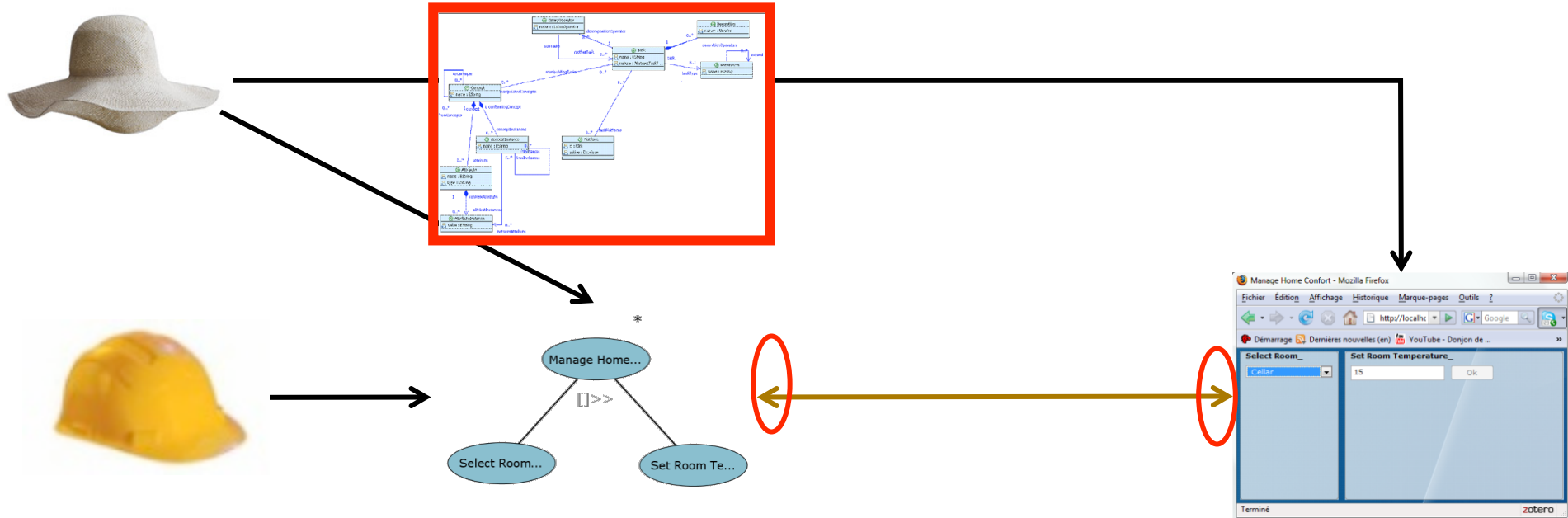
From tailored to malleable UIs



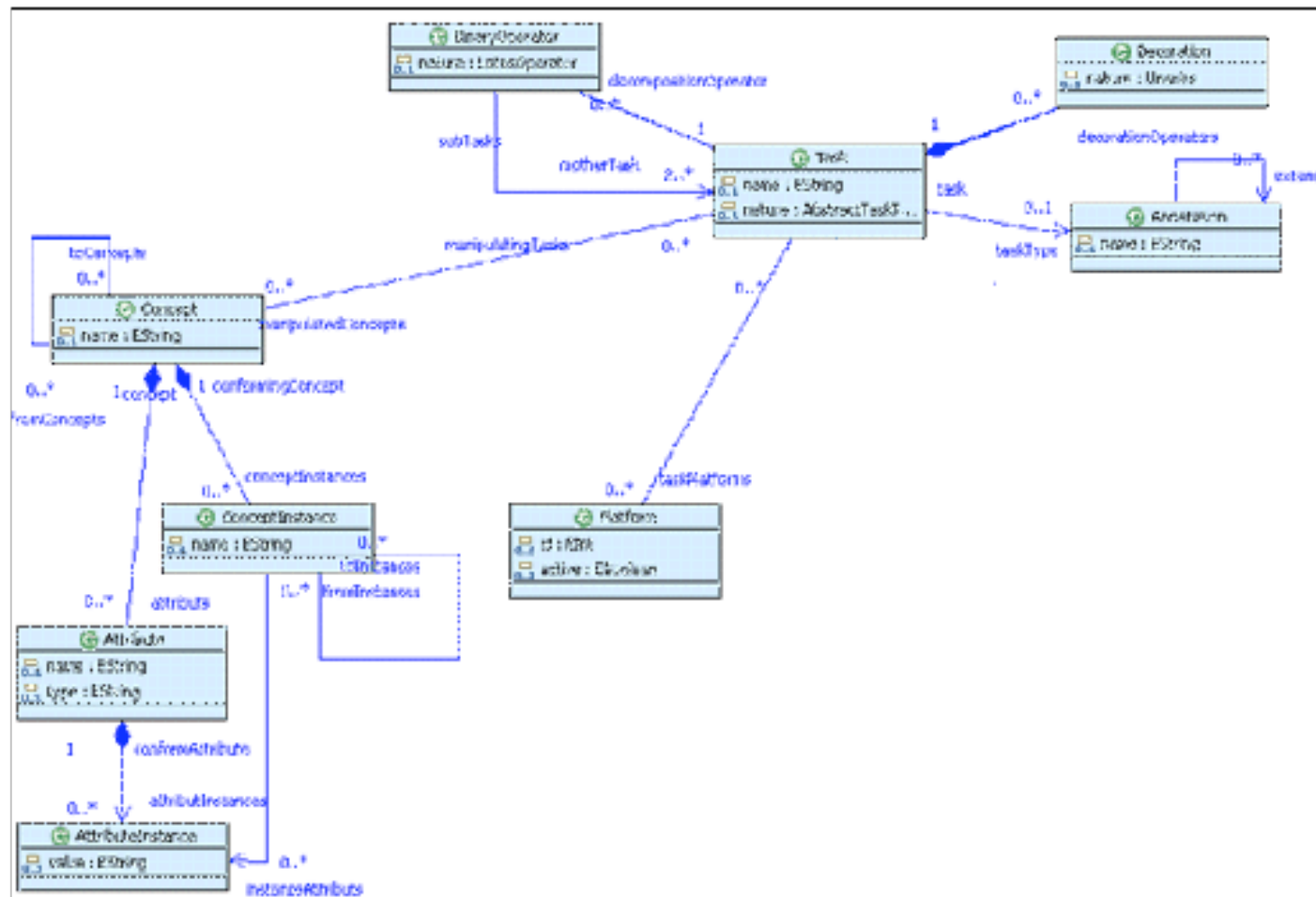
From tailored to malleable UIs



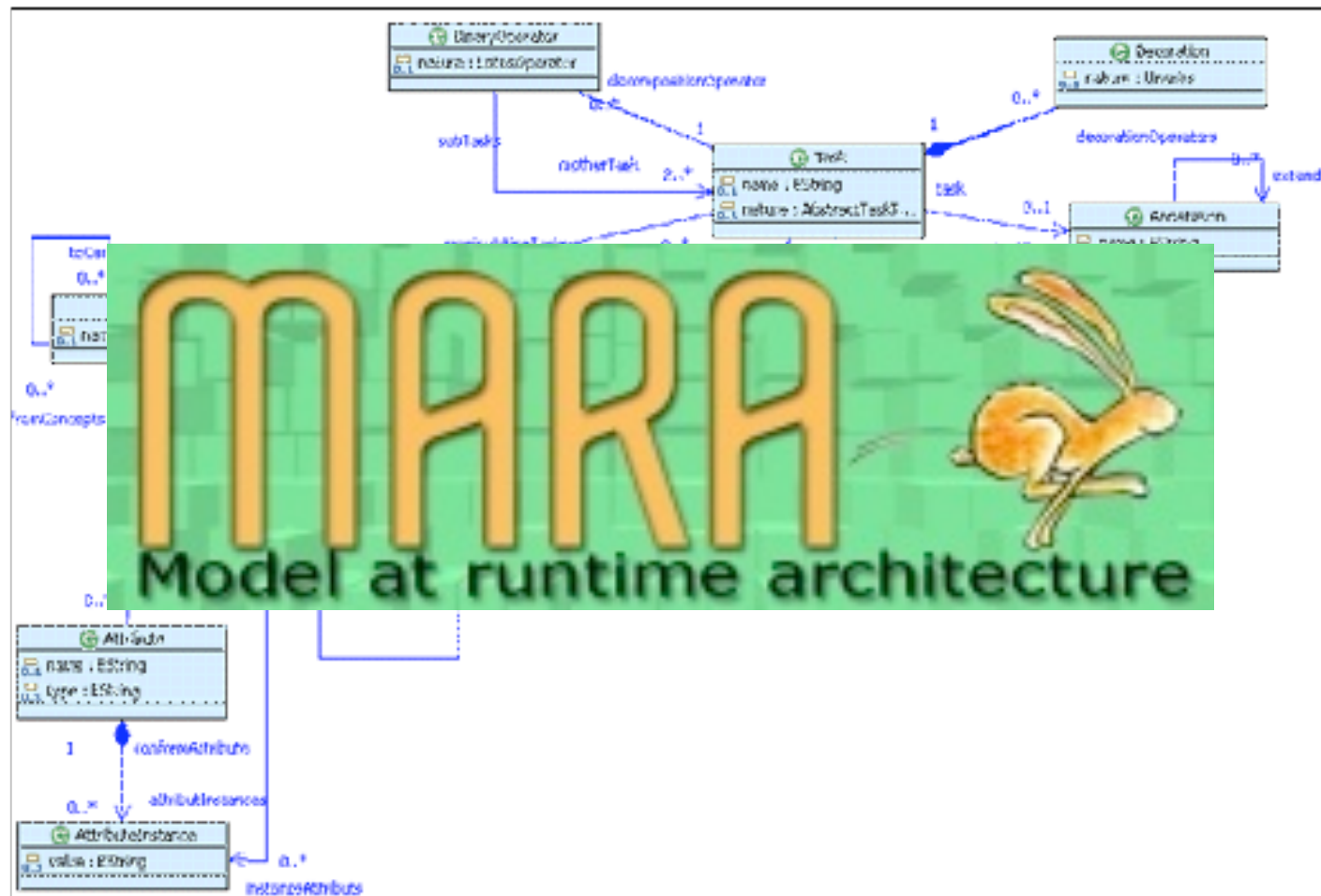
From tailored to malleable UIs



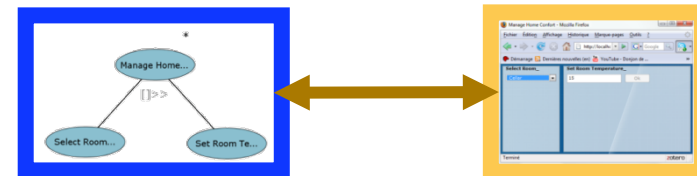
From tailored to malleable UIs



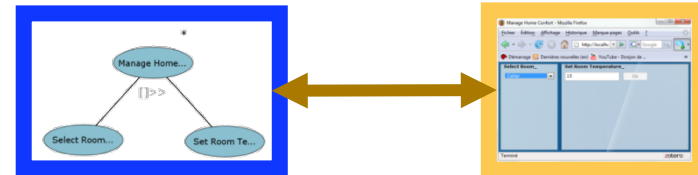
From tailored to malleable UIs



- Rapid prototyping

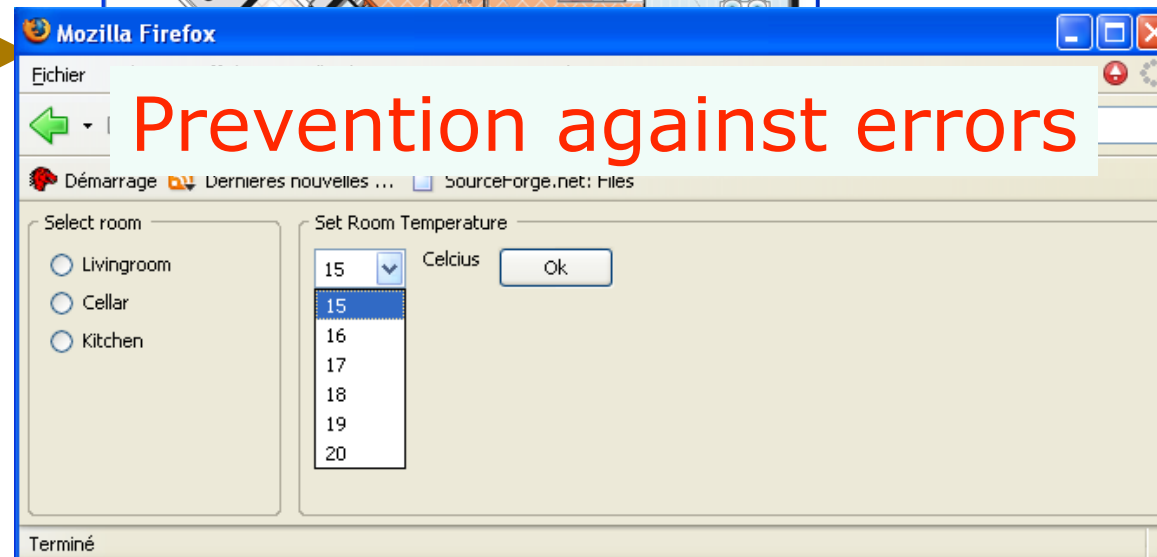
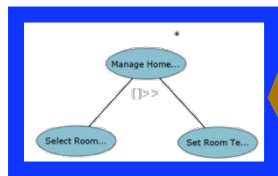
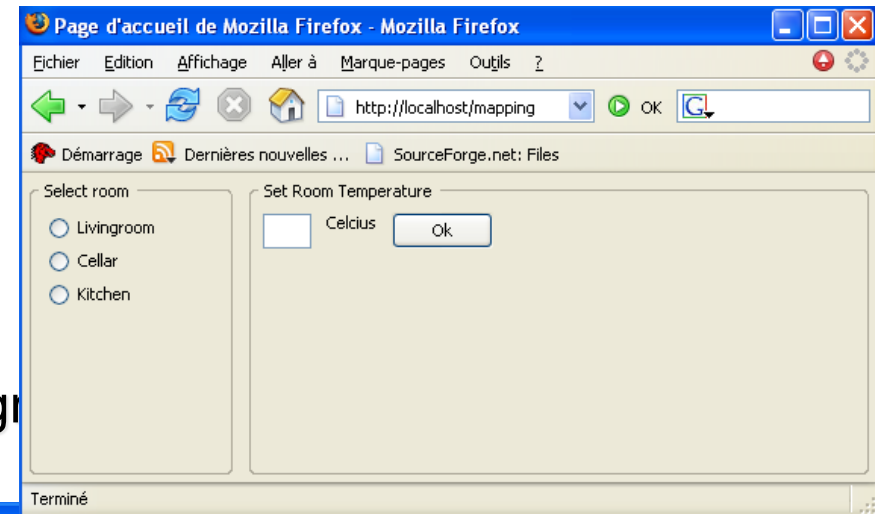


- Rapid prototyping
- Exploration and comparison of design alternatives

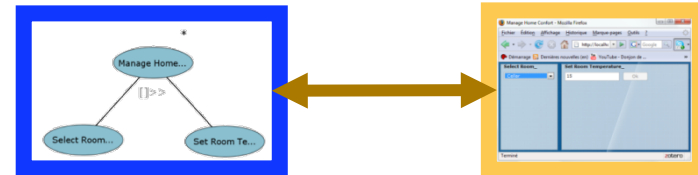


Malleability: many applications

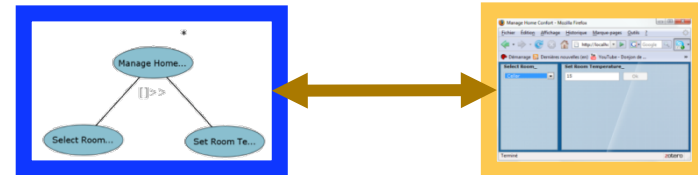
- Rapid prototyping
- Exploration and comparison of design



- Rapid prototyping
- Exploration and comparison of design alternatives
- Adaptation to the context of use



- Rapid prototyping
- Exploration and comparison of design alternatives
- Adaptation to the context of use
- Teaching of both HCI and MDE





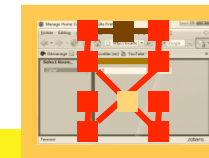
In summary : Malleability

- Models at runtime
- UI's transformation through malleability points
- Several applications

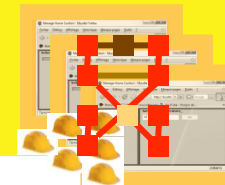
- Model Driven Engineering and **megamodel**



- **Megamodel** and system:
malleability of UIs



- **Megamodel** and development:
mega-UI



- **Megamodel** and domain:
cartography



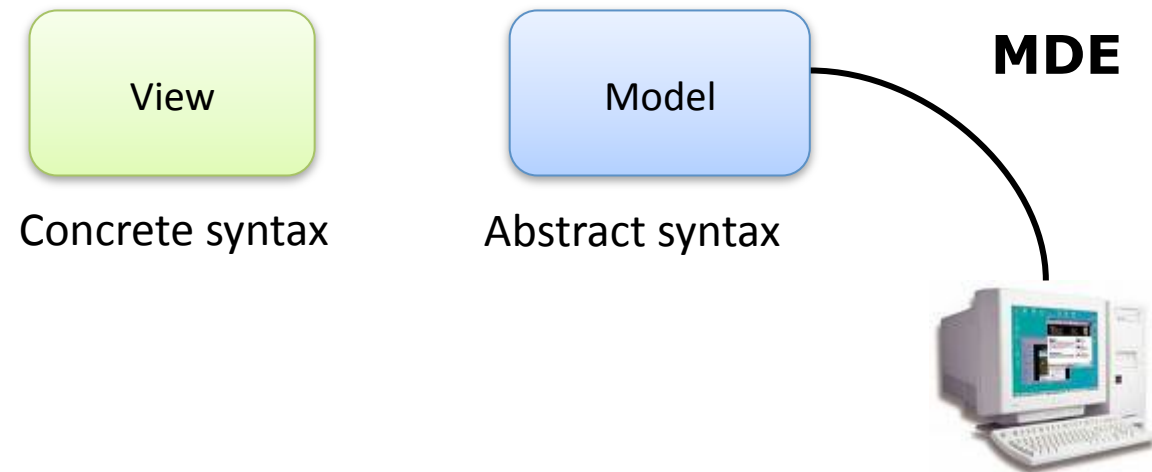
- Conclusion

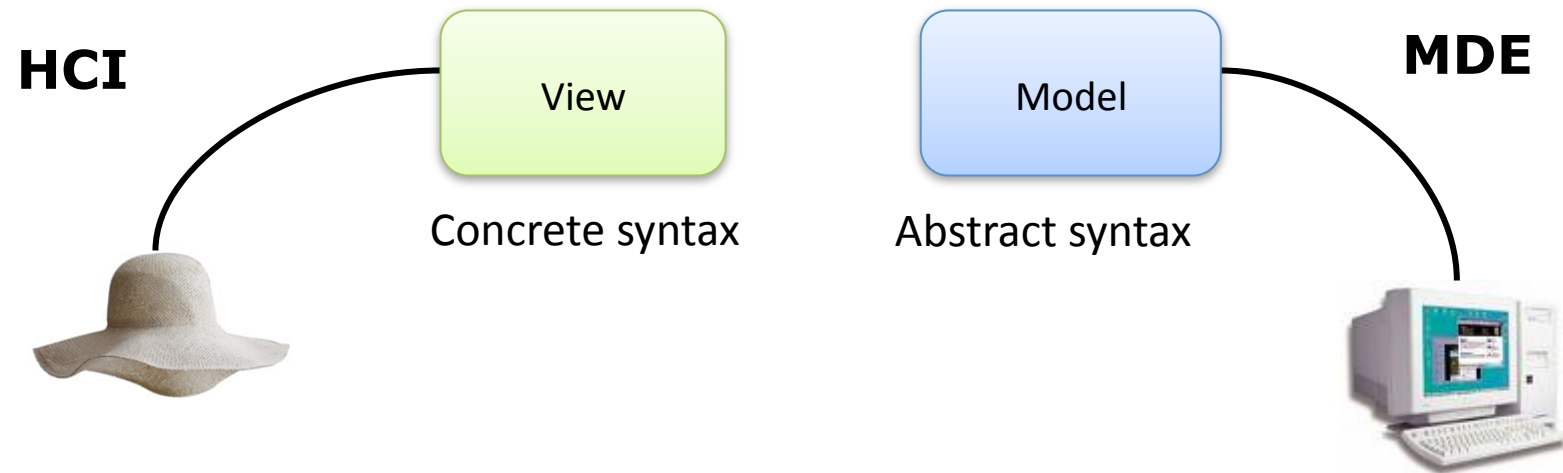




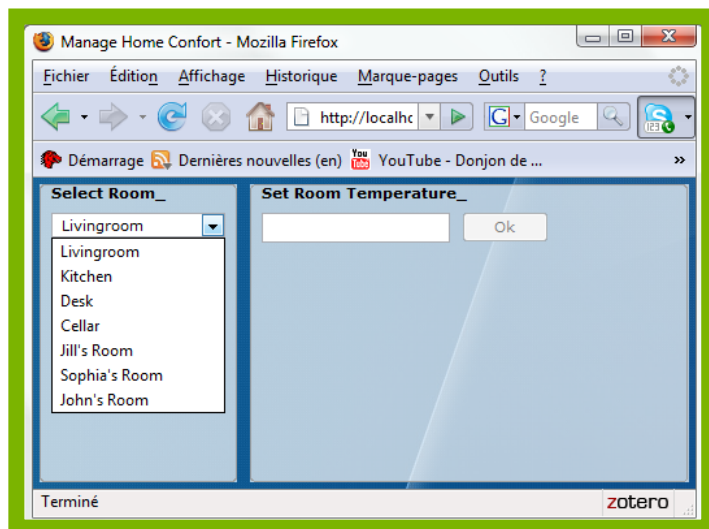
View versus model



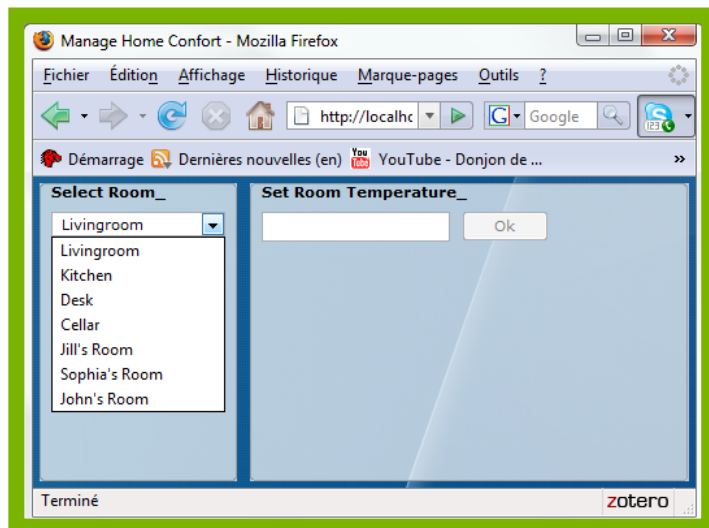
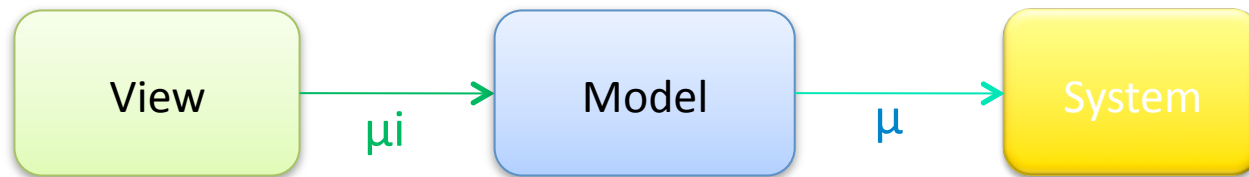




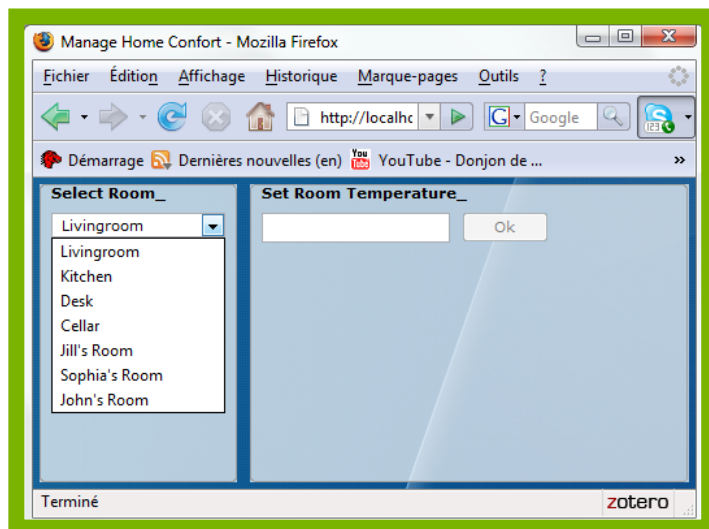
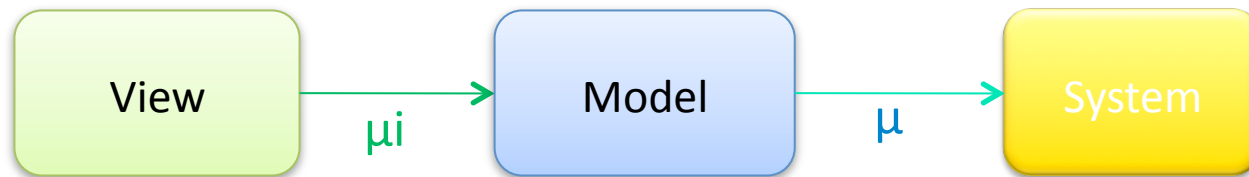
- A view on the system for a given user : concretization of the “ μ ” relation (μi)



- View of a model that represents a system



- View of a model that represents a system



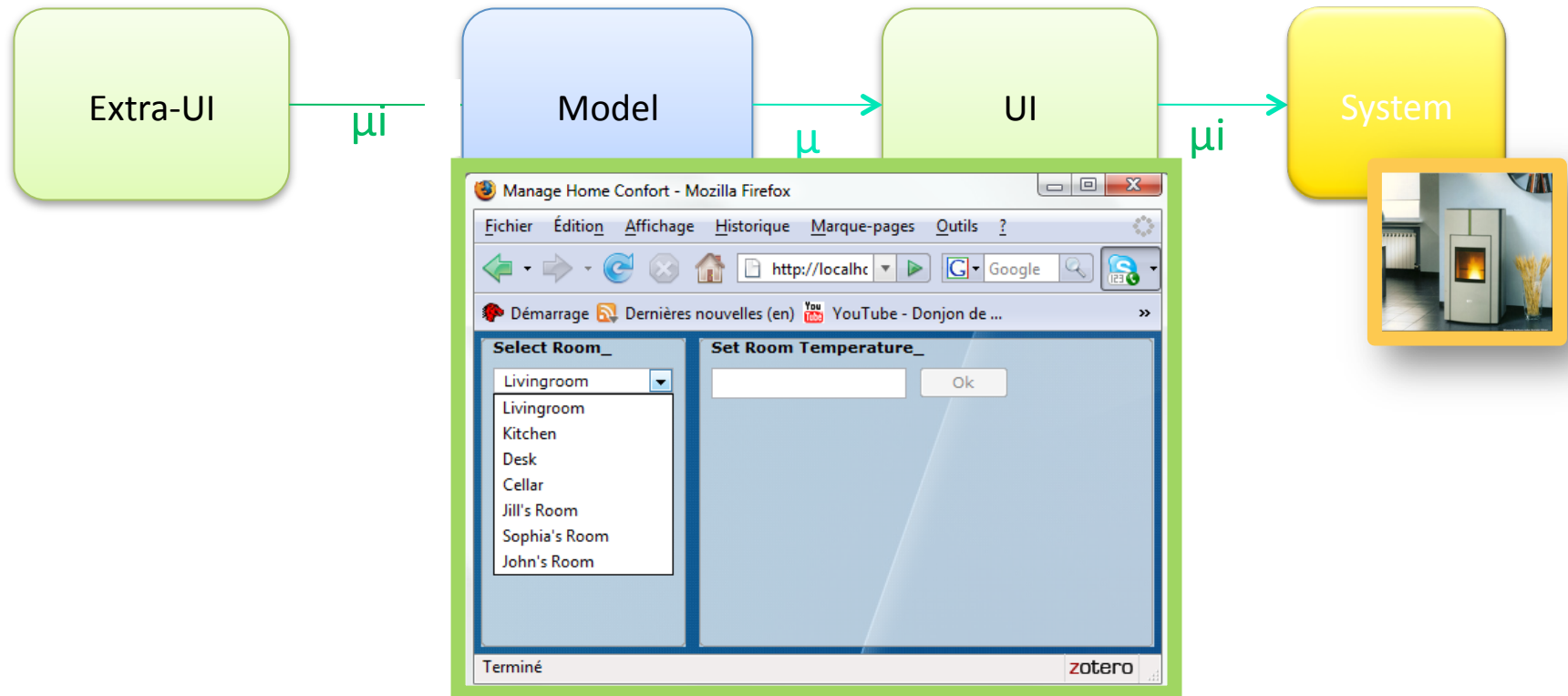
```

<ApplicationModel>
<RoomList>
  <rooms name=Cellar
function: ==@@ApplicationModel.0/@Function.0 />
  <rooms name=Kitchen
function: ==@@ApplicationModel.0/@Function.1 />
  <rooms name= AlexDesk
function: ==@@ApplicationModel.0/@Function.2 />
  <rooms name=LivingRoom
function: ==@@ApplicationModel.0/@Function.3 />
</RoomList>
  <Function name=SetCellar
...
</ApplicationModel>
  
```



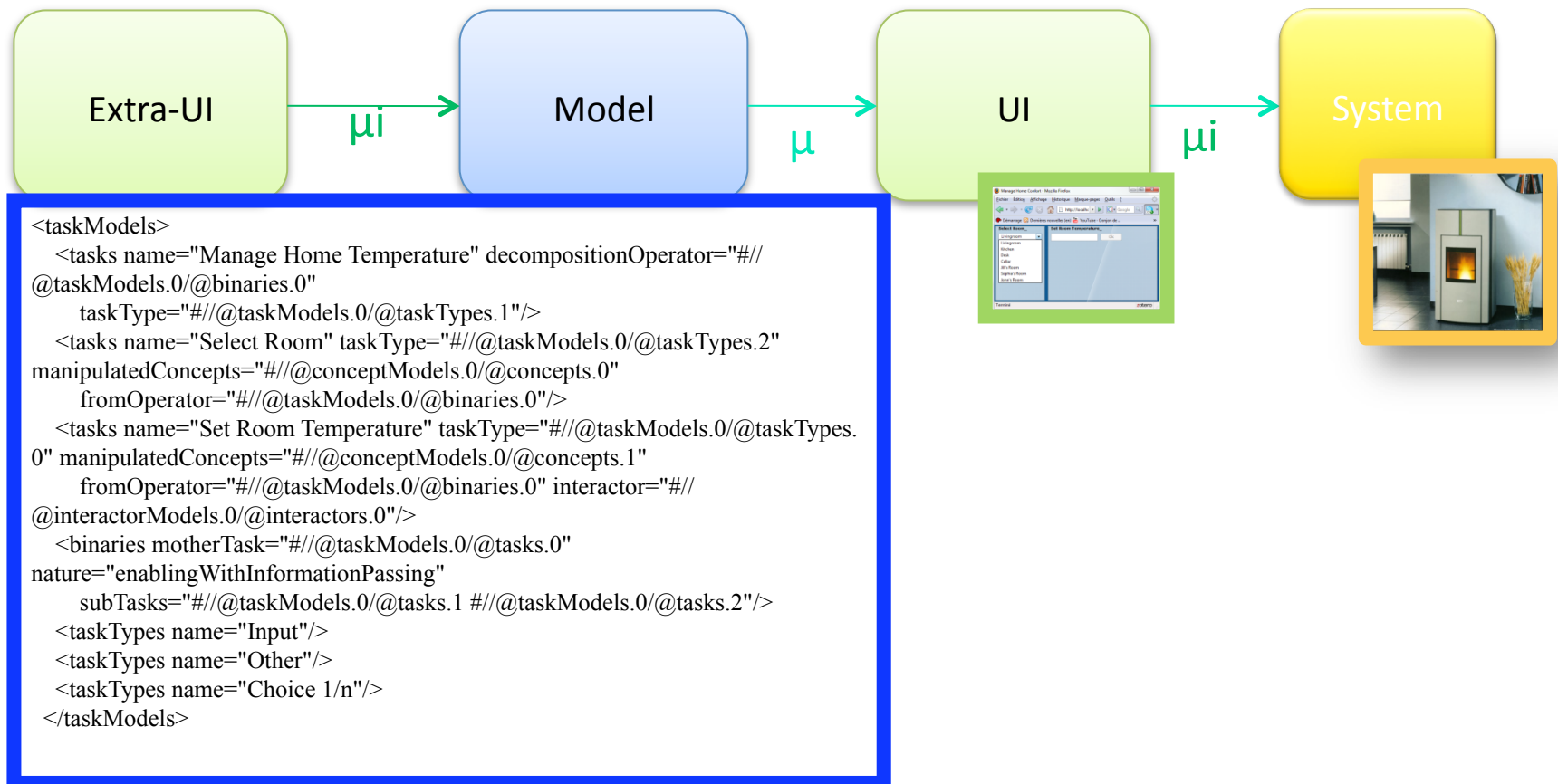
■ Extra-UI

- UI of a UI's model



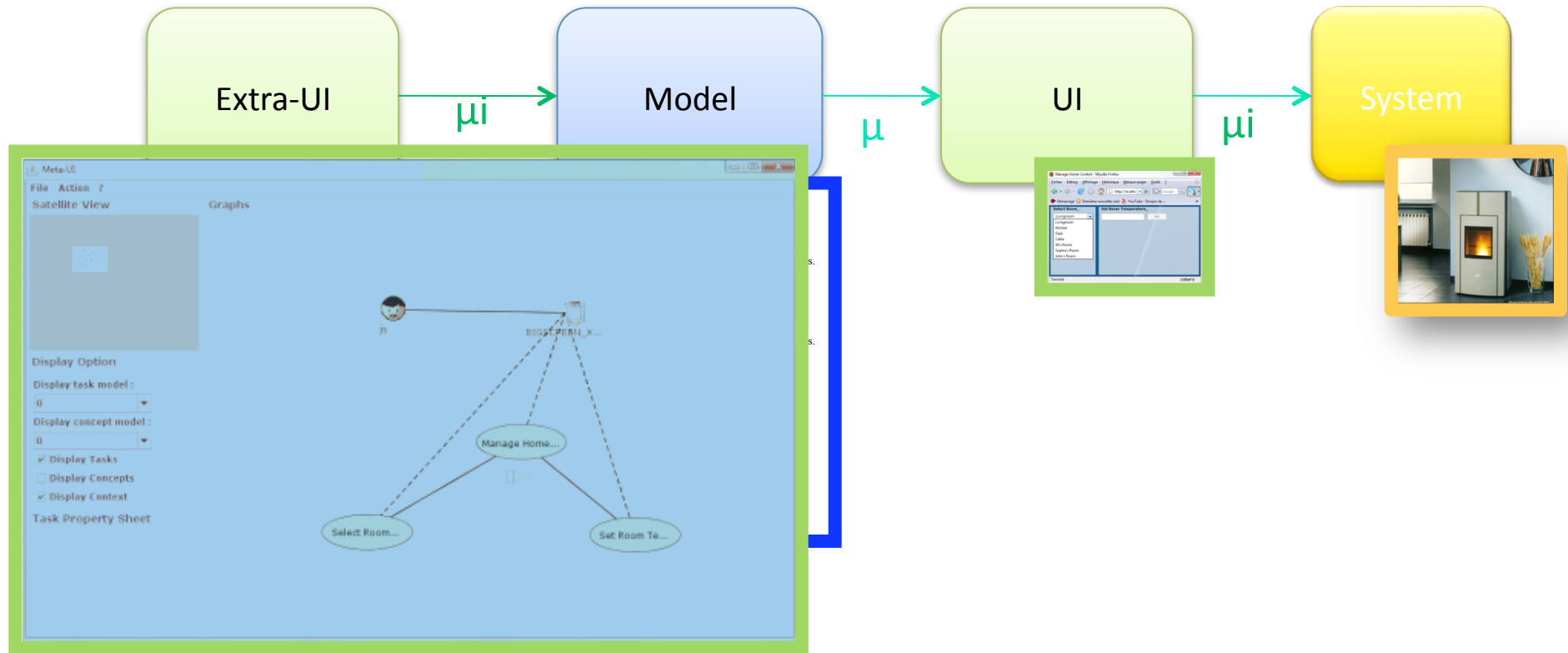
■ Extra-UI

➤ UI of a UI's model

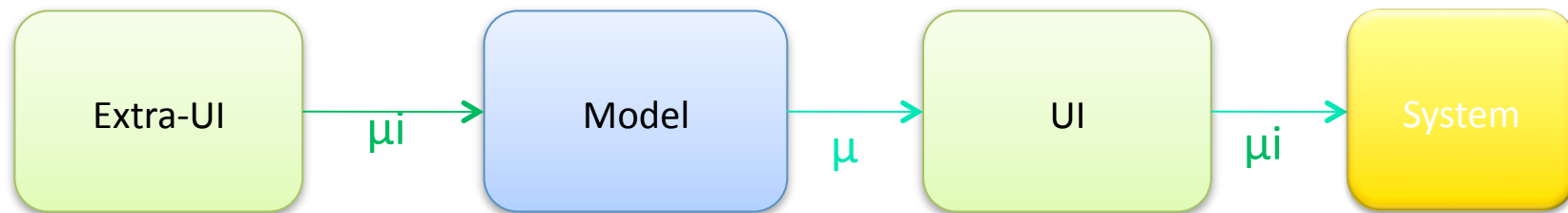


■ Extra-UI

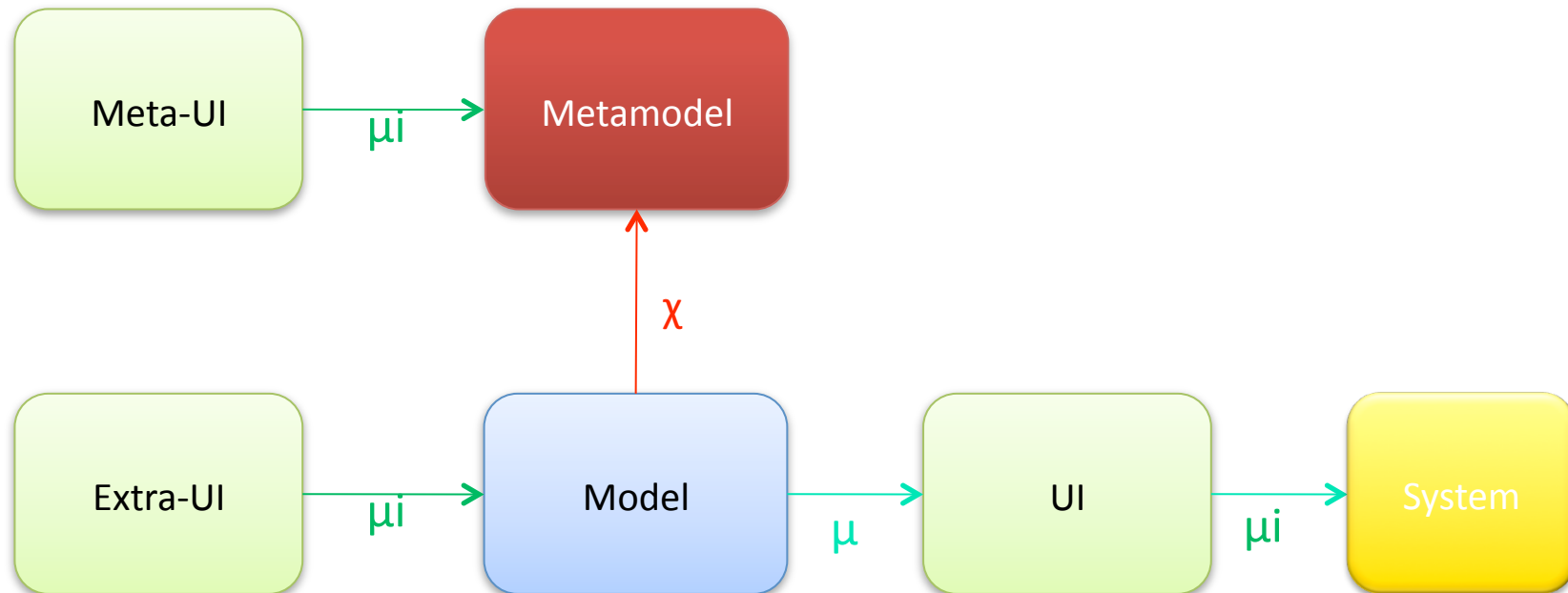
- UI of a UI's model



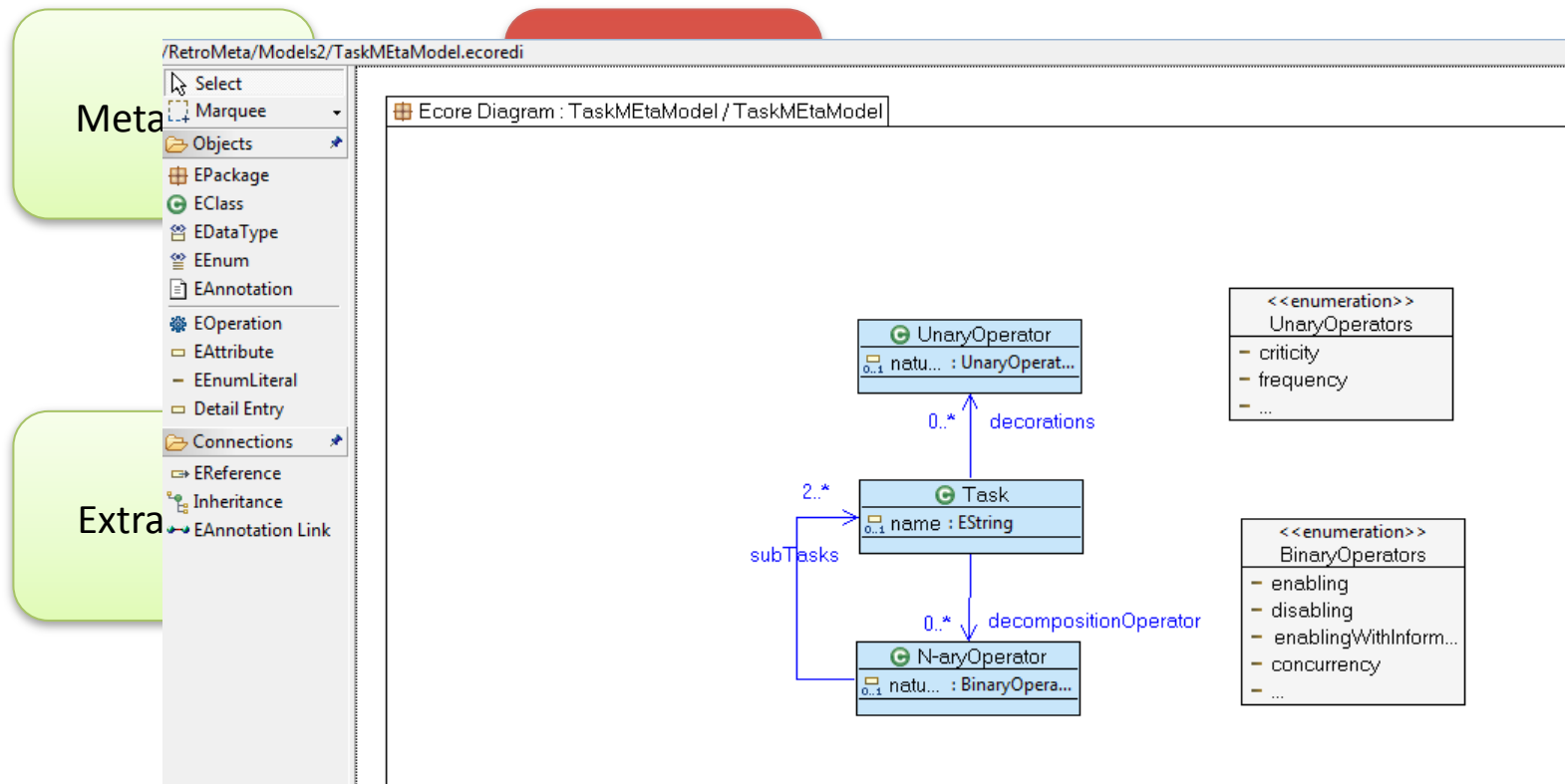
■ Extra-UI



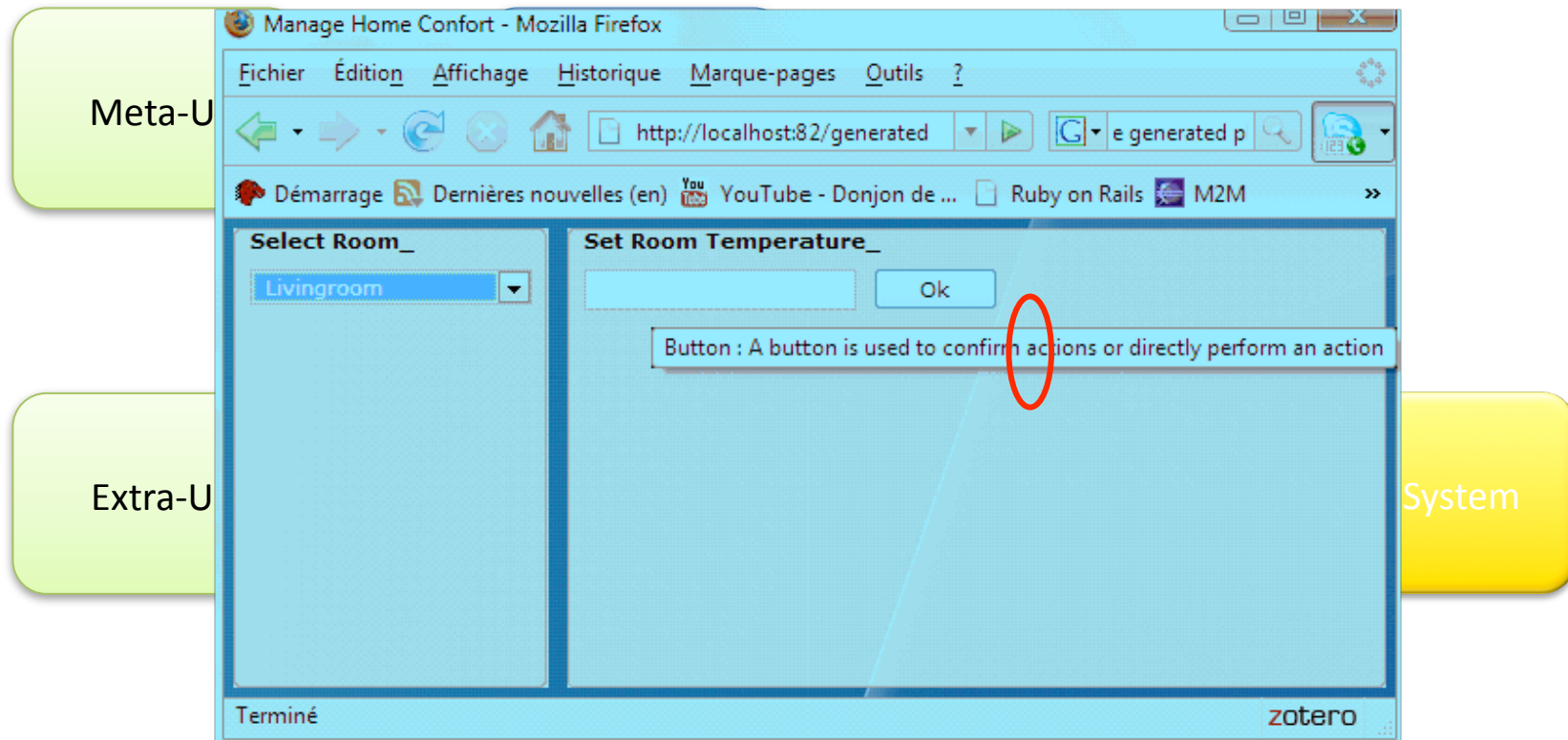
■ Meta-UI



■ Meta-UI

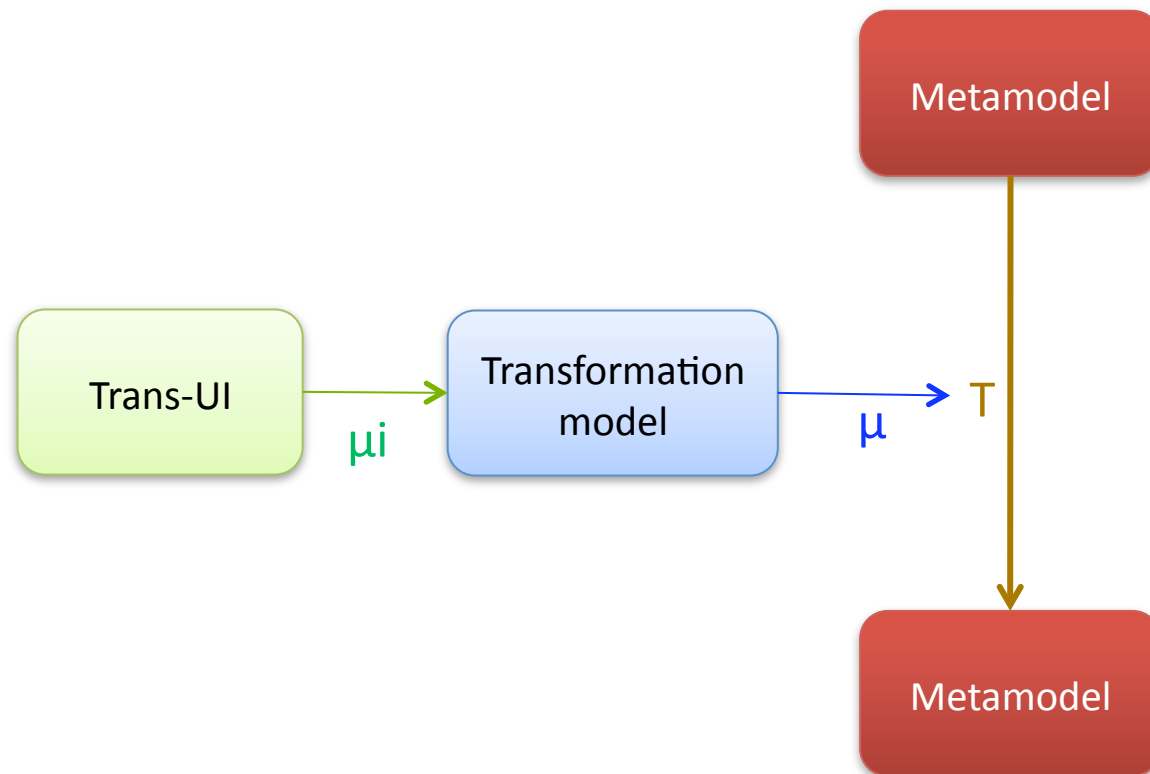


■ Meta-UI



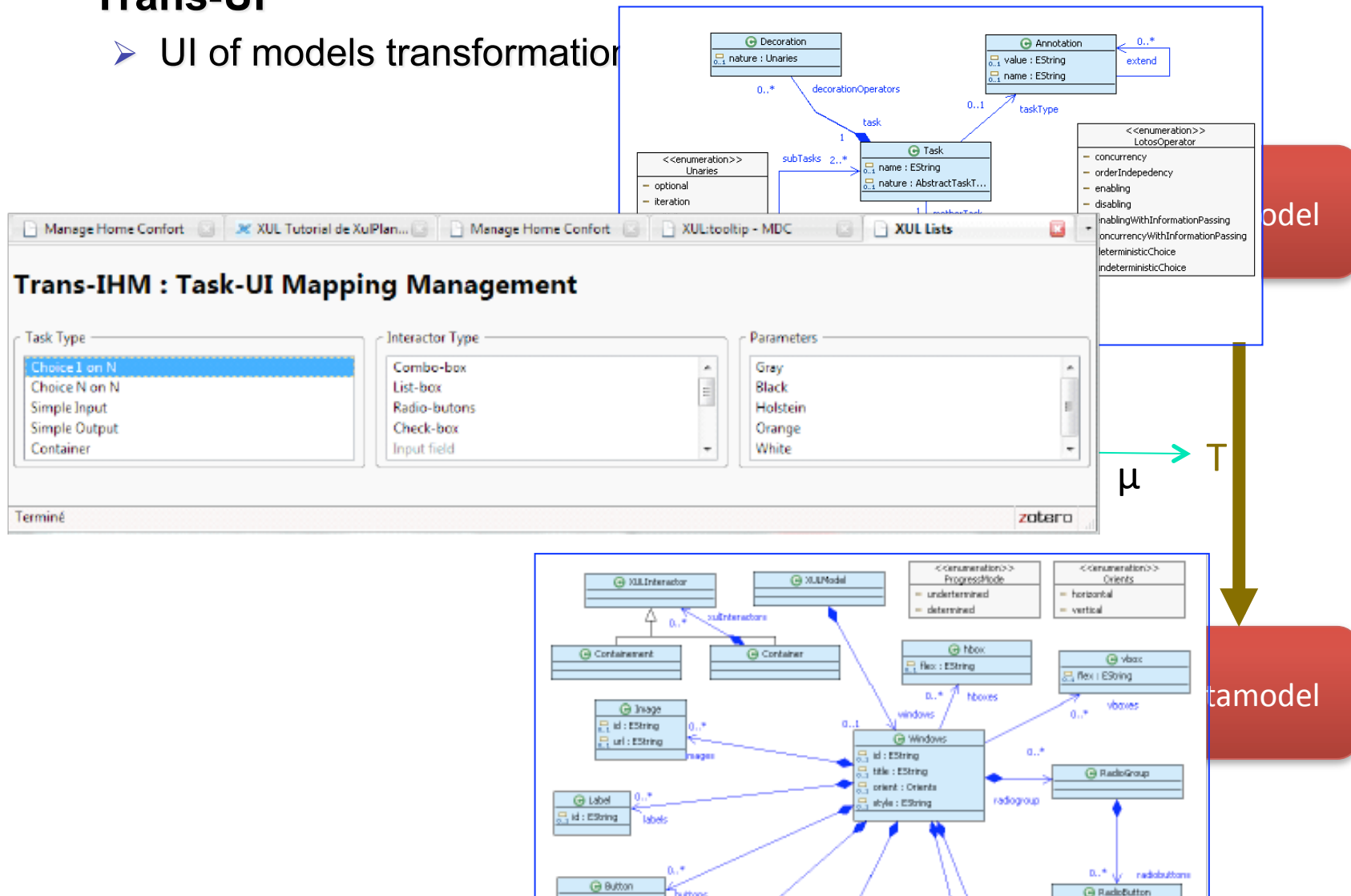
■ Trans-UI

- UI of models transformations



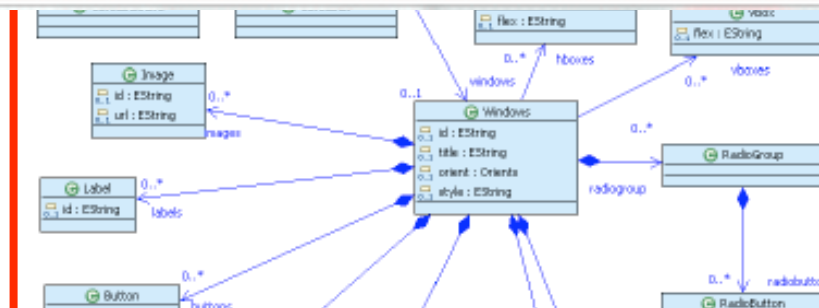
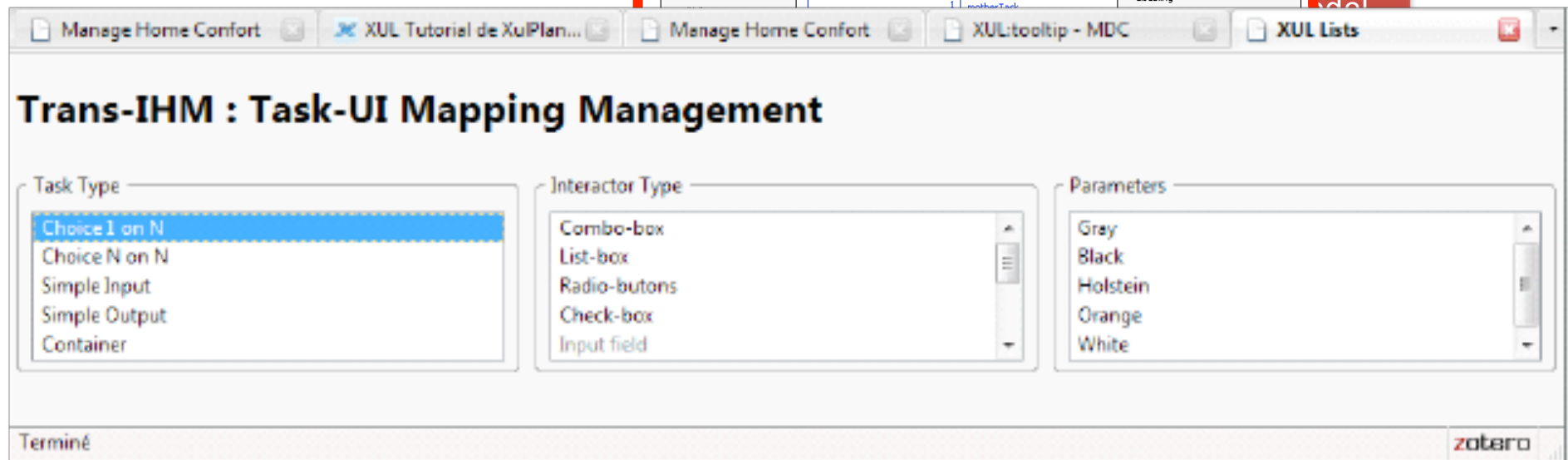
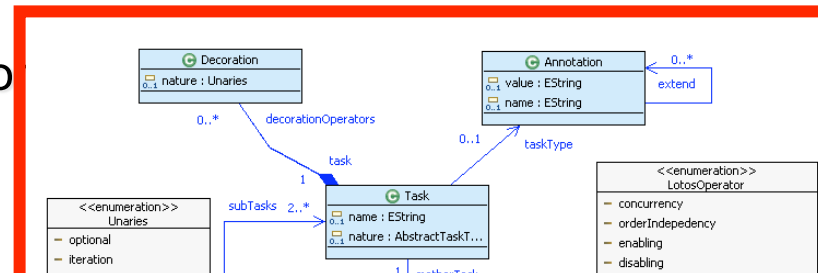
■ Trans-UI

- UI of models transformation

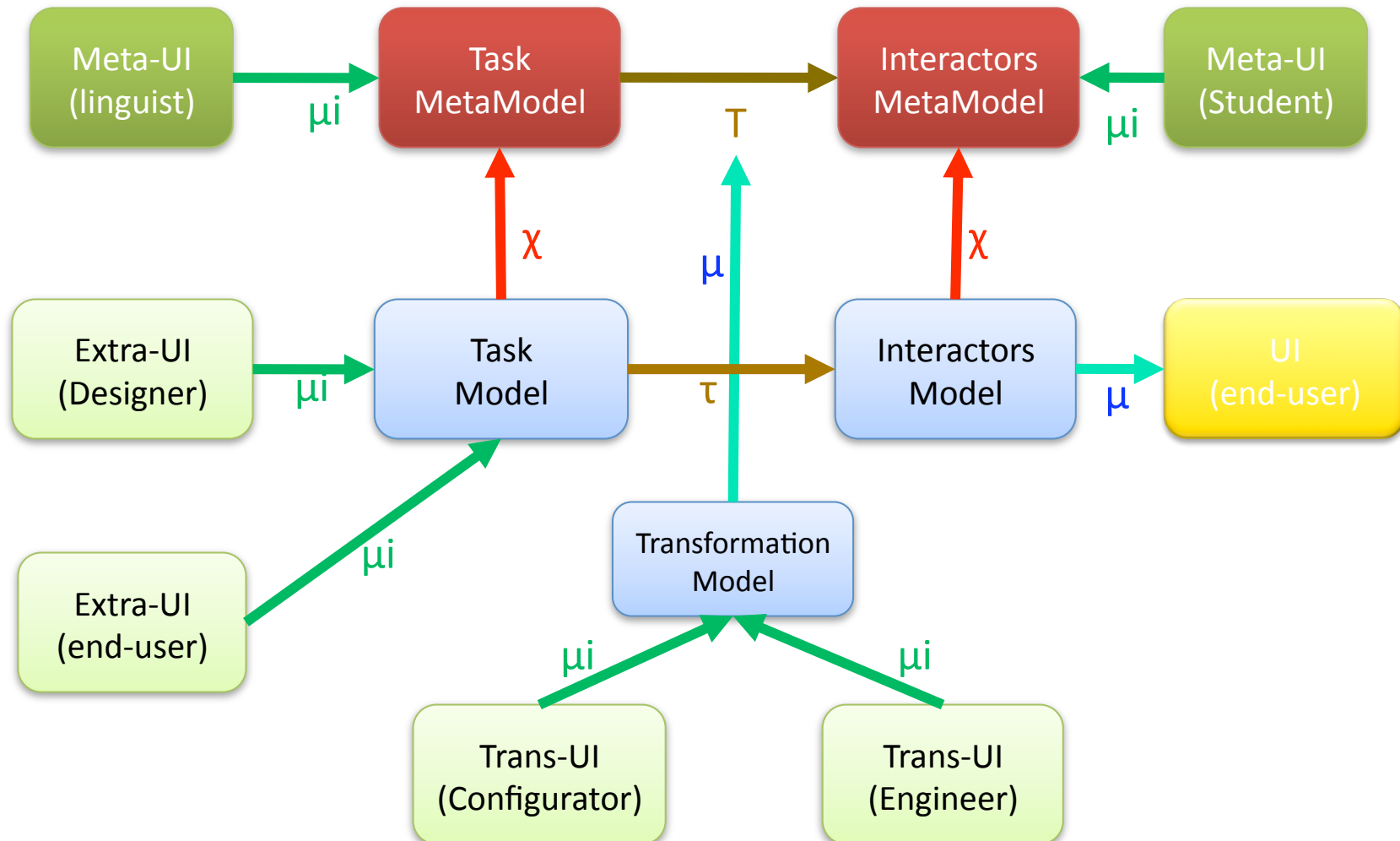


■ Trans-UI

- UI of models transformation



amodel





In summary : Mega-UI

- Models are observable and modifiable by the designer and/or the end-user
- Abstract versus concrete syntax machines *versus* humans
- Taxonomy of UIs
- Mega-UI for controlling *everything*



Voyages sncf.com
plus loin que vous ne l'imaginez

ACCUEIL TRAIN VOL VOITURE HOTEL FRAN

Accéder à mon compte

Réservez votre voyage

☒ train ☐ vol ☐ hôtel ☐ voiture ☐ séjour

Réservez en une seule fois et économisez !

Ajoutez à votre train : ☐ une voiture ☐ un hôtel

Départ *

Arrivée *

Aller le * à partir de 07h

Retour le à partir de 07h

Adultes 1e classe ☒ 2e classe

☐ trajets directs [> Recherche avancée](#) (12-25, Senior, Smile's, Pays de retrait ...)

Horaires seuls **Rechercher**

UI 1



Voyages sncf.com
plus loin que vous ne l'imaginez

ACCUEIL TRAIN VOL VOITURE HOTEL FRAN

Accéder à mon compte

Réservez votre voyage

☒ train ☐ vol ☐ hôtel ☐ voiture ☐ séjour

Réservez en une seule fois et économisez !

Ajoutez à votre train : ☐ une voiture ☐ un hôtel

Départ *

Arrivée *

Aller le * à partir de 07h

Retour le à partir de 07h

Adultes 1e classe ☒ 2e classe

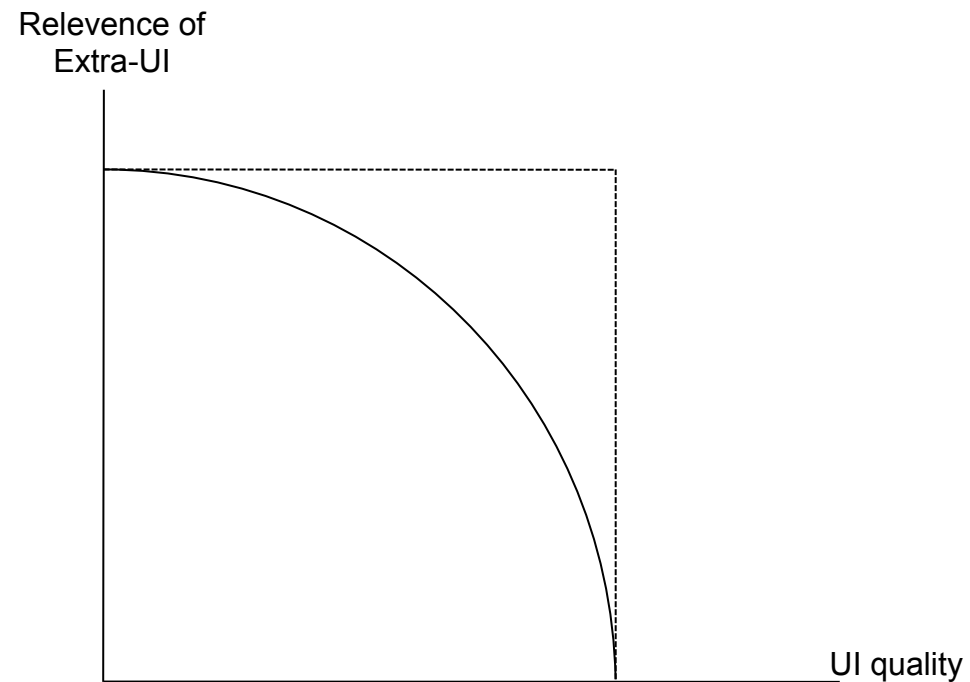
☐ trajets directs [> Recherche avancée](#) (12-25, Senior, Smile's, Pays de retrait ...)

Horaires seuls **Rechercher**

Consulter les horaires uniquement

UI 2

- To be assessed...



- Extra-UI: quality *patch*?



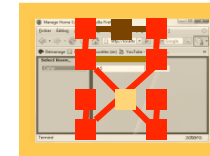
In summary : Mega-UI

- Models are observable and modifiable
the designer and/or the end-user
- Abstract versus concrete syntax
machines *versus* humans
- Taxonomy of UIs
- Mega-UI for controlling *everything*
Locally only

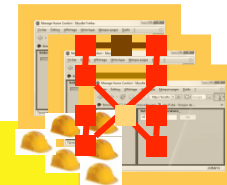
- Model Driven Engineering and **megamodel**



- **Megamodel** and system:
malleability of UIs



- **Megamodel** and development:
mega-UI



- **Megamodel** and domain:
cartography

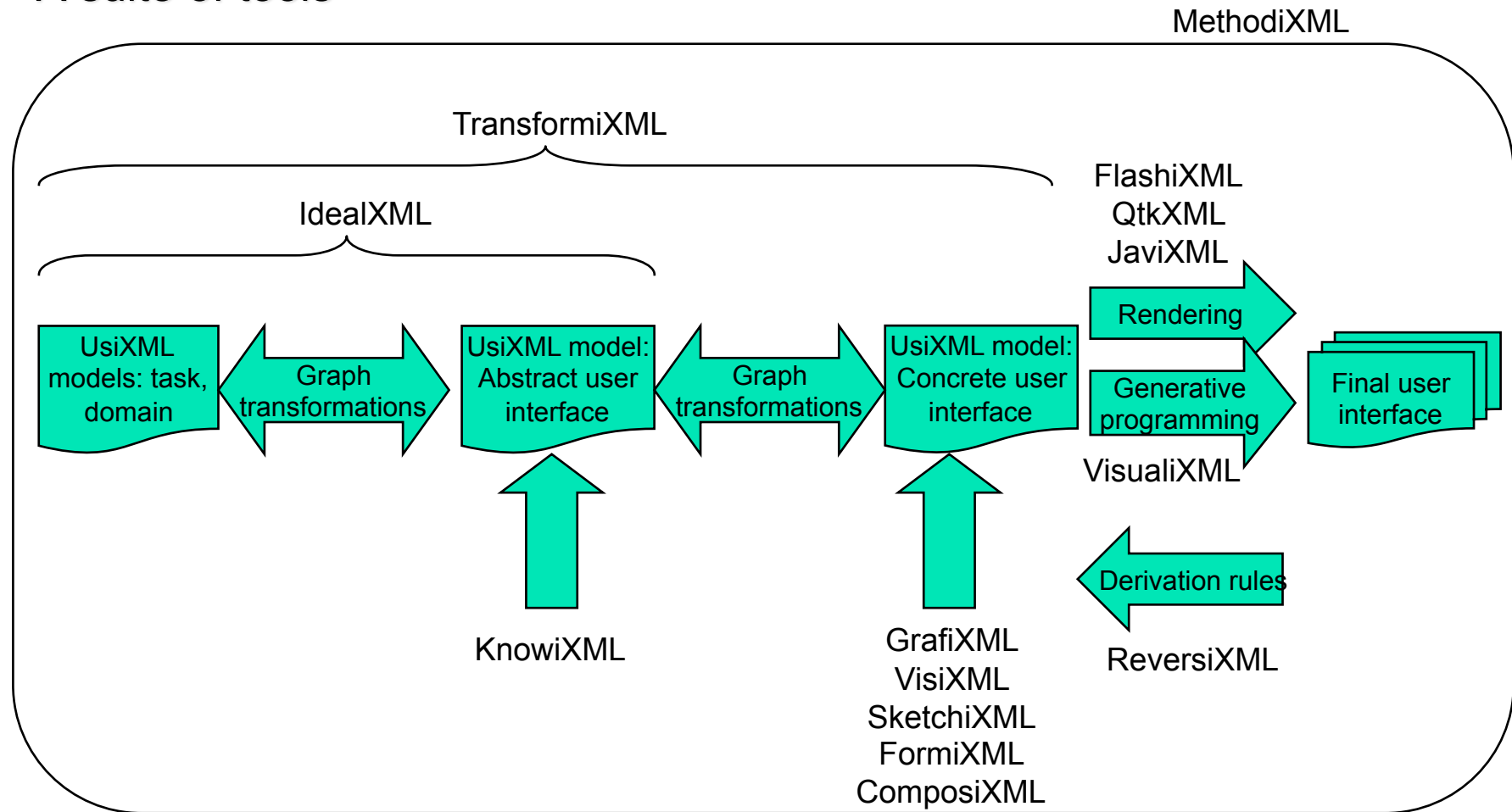


- Conclusion

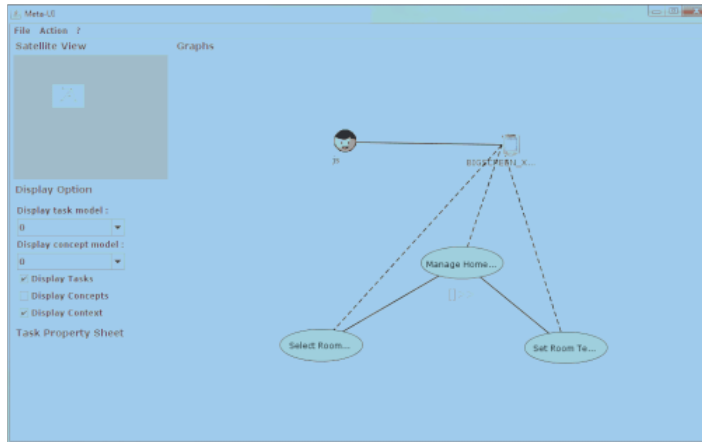


- Many User Interface Description Languages
- Focus initially put on the presentation
 - UIML, XUL, XAML, MXML, ...
 - Similar to Platform Specific/Independent Models from MDA
- One huge initiative: UsiXML (Université catholique de Louvain, Belgium)
 - <http://www.usixml.org/>
 - Covers higher levels of abstraction
 - Under standardization by the W3C
 - A european project
 - A language & a suite of tools

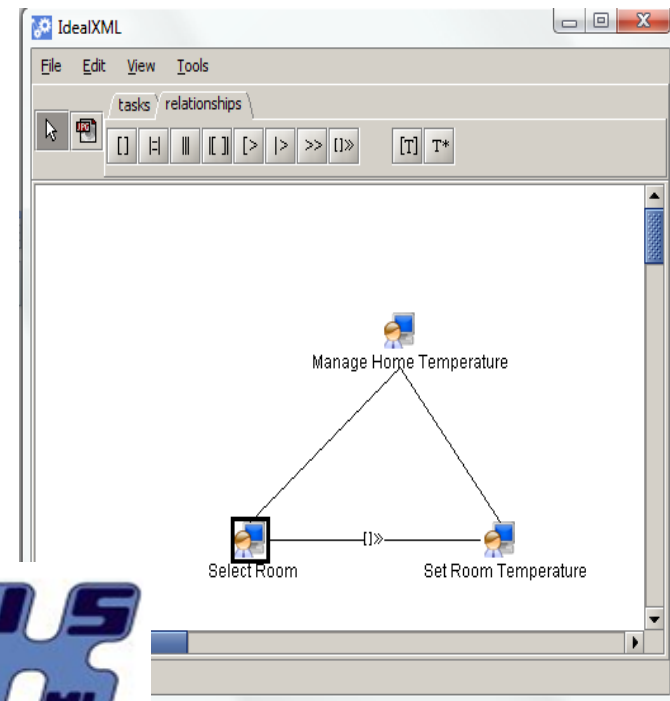
■ A suite of tools



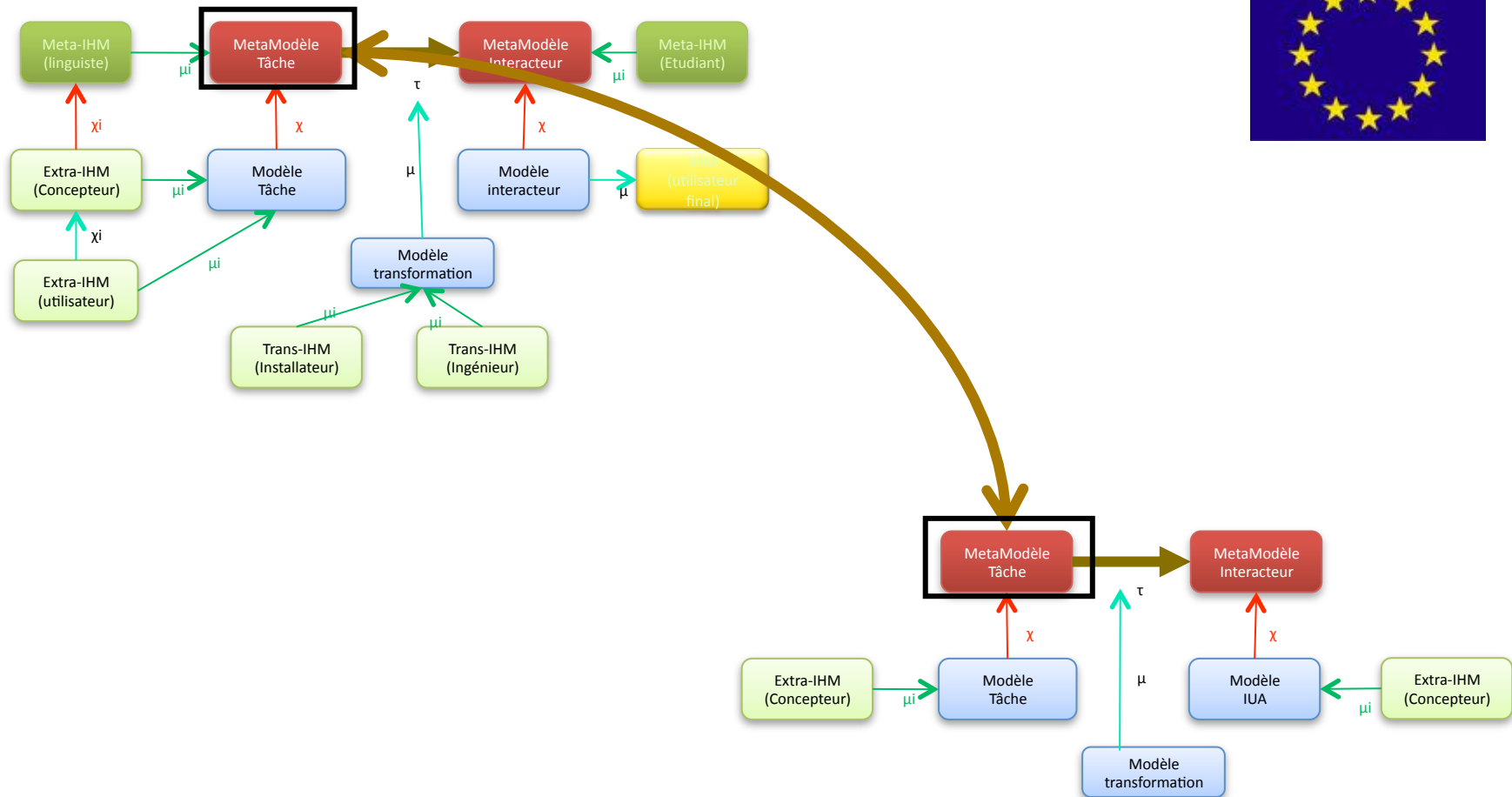
Gateways between tools and languages



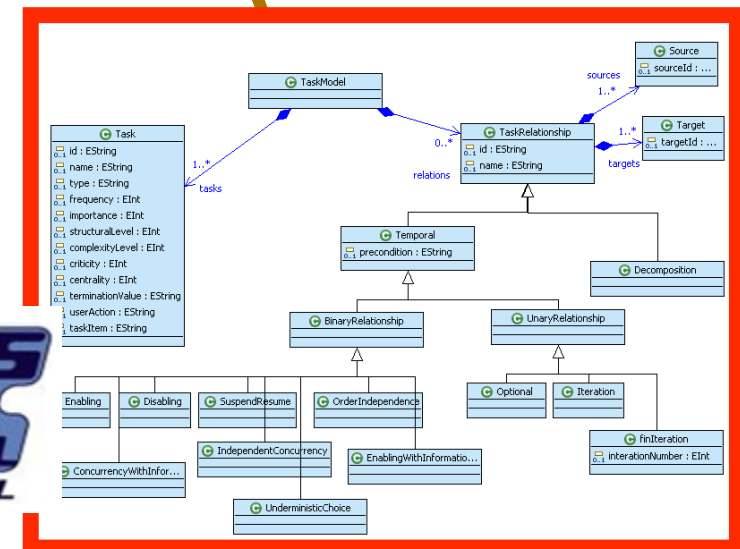
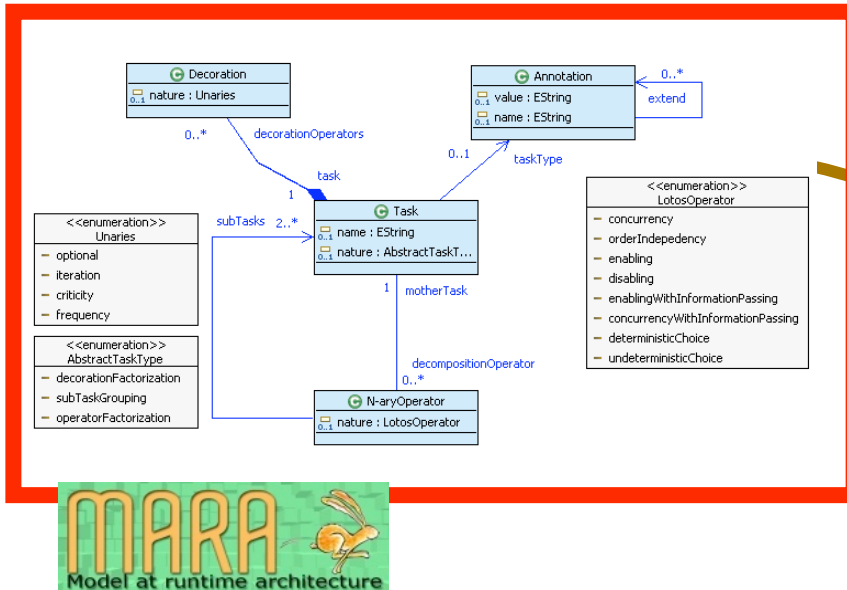
?



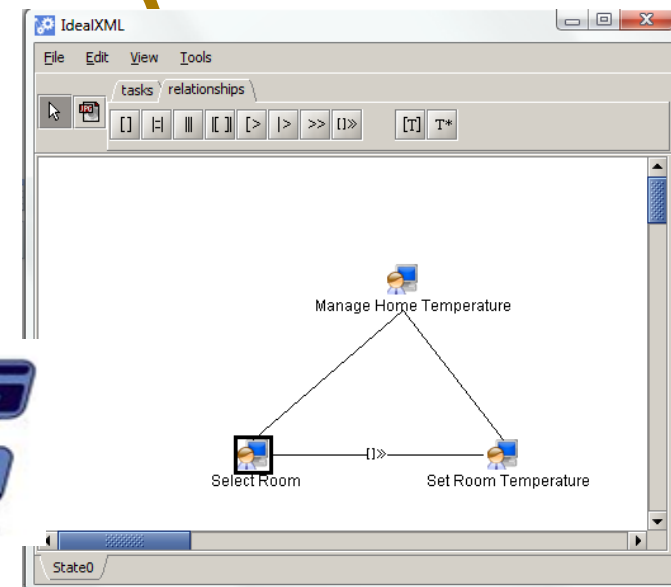
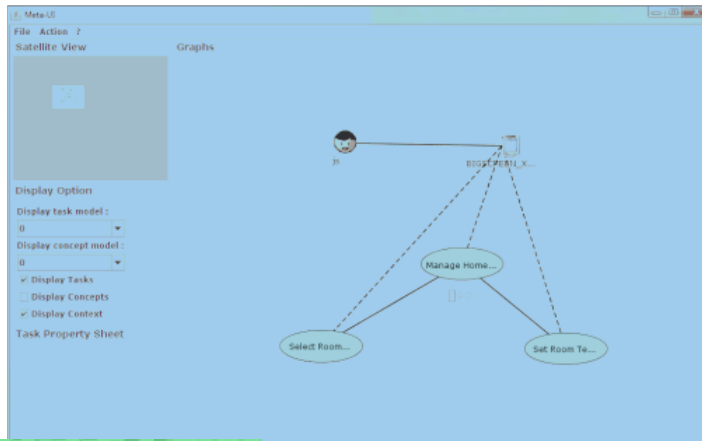
Gateways between tools and languages

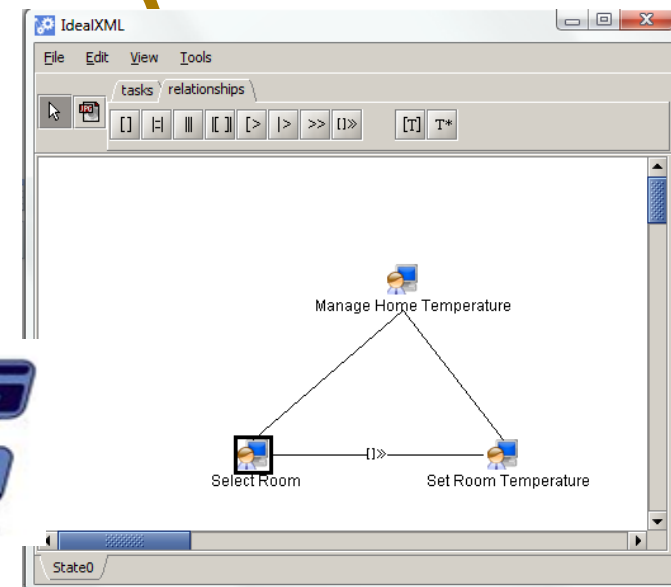
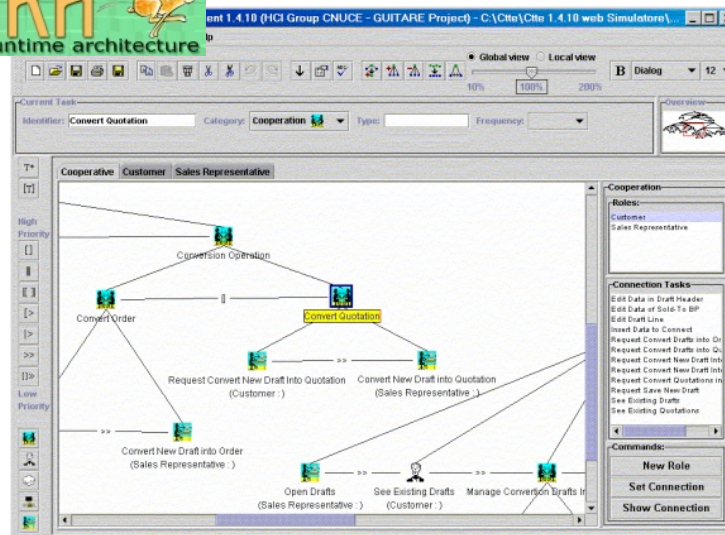
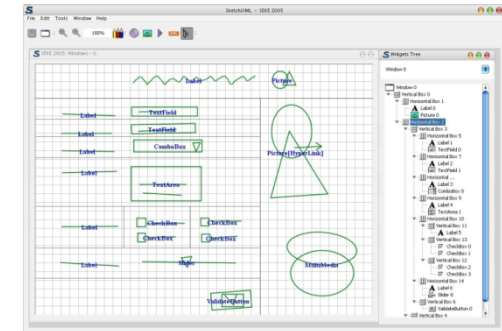
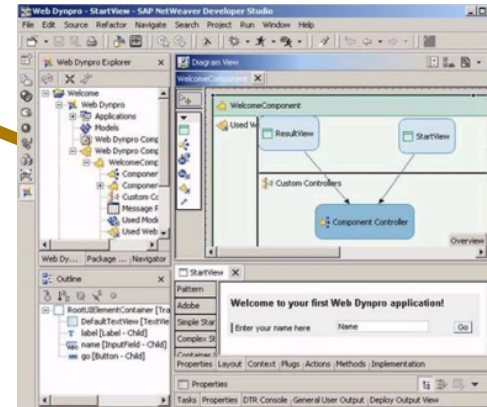
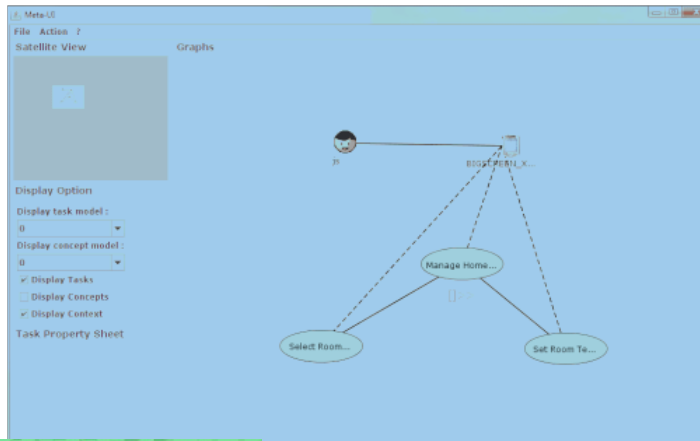


Gateways between tools and languages



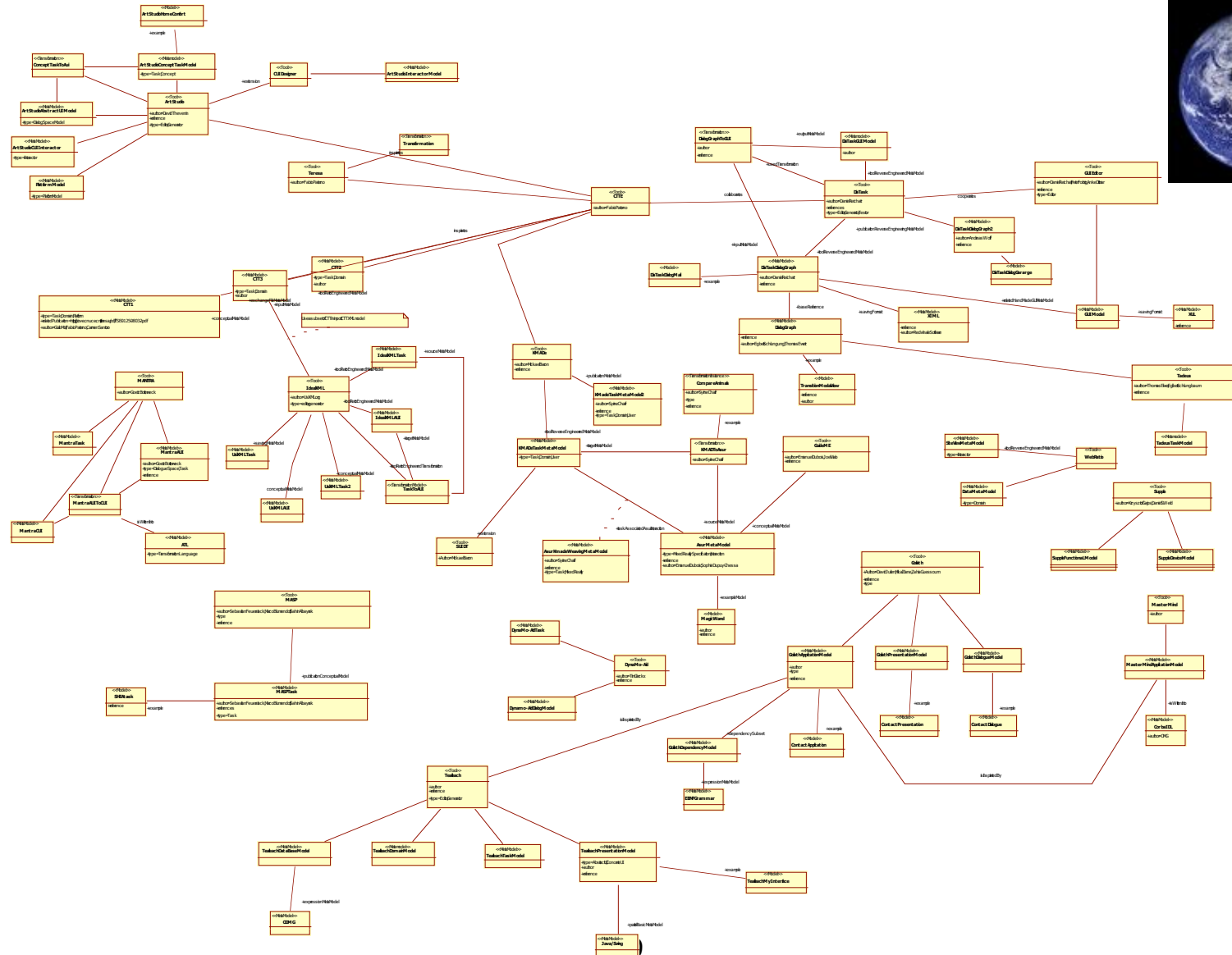
Gateways between tools and languages

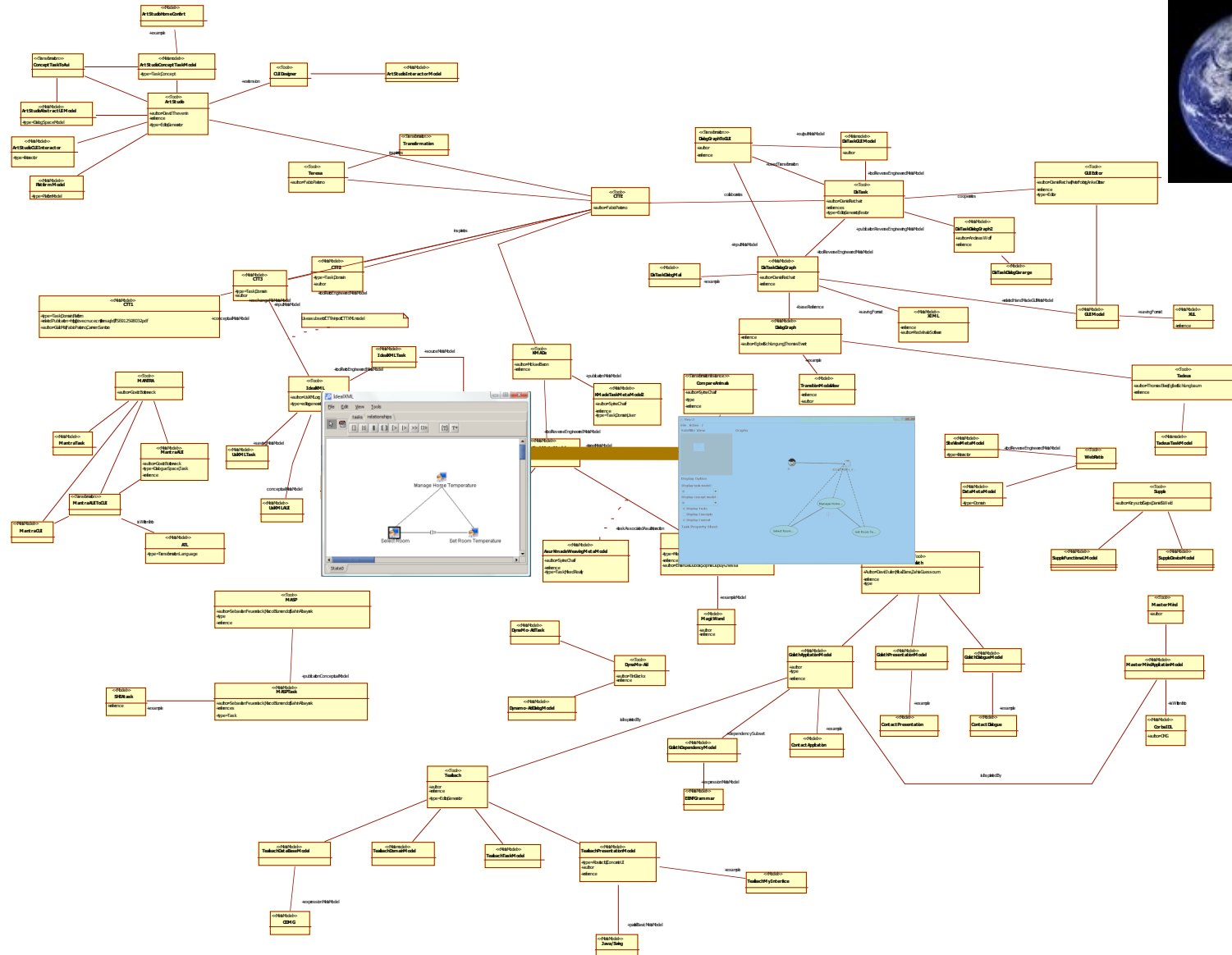


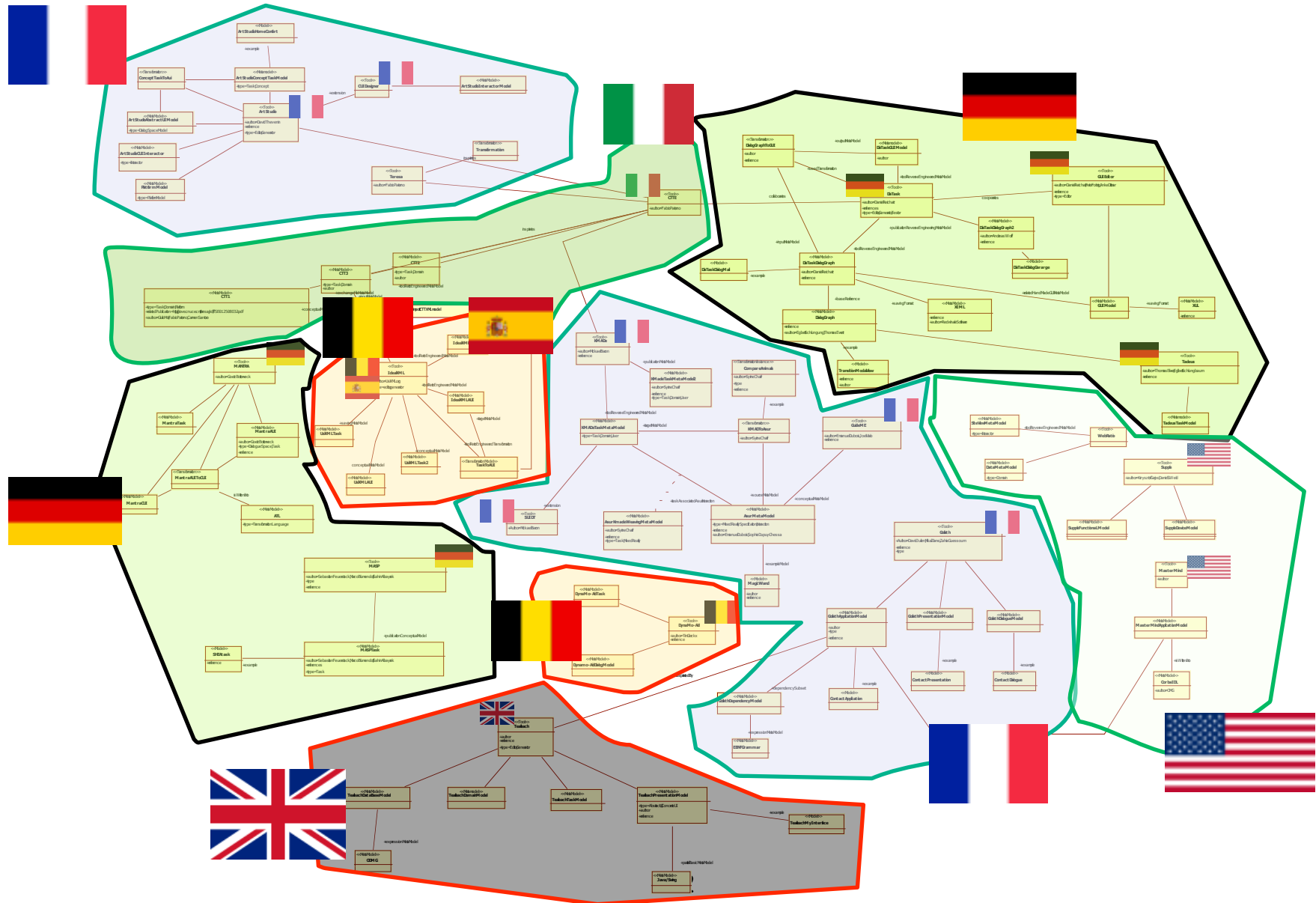




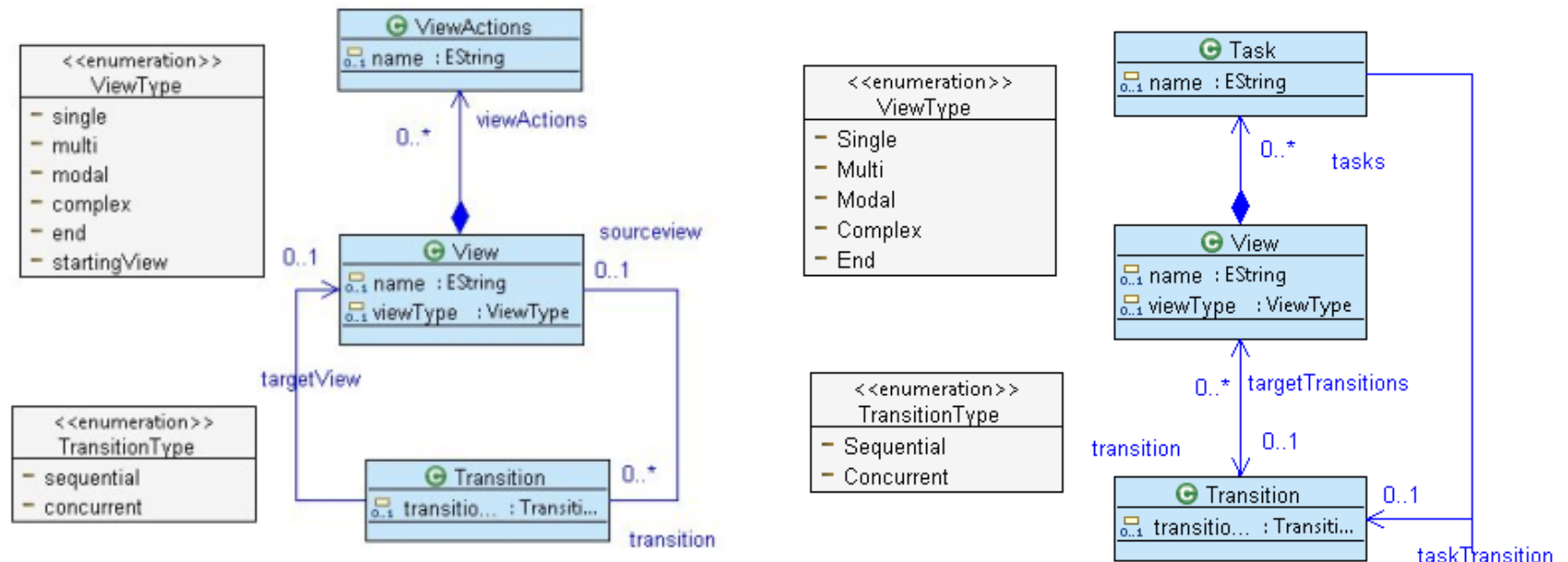
Cartography







Cartography: Evolution



Dialogue Graph

DiaTask V1.0

CTTe

Mozilla

-8 Before DiaTask
1996

2004

53

2005

- Megamodel for the **domains**
 - research
 - industry
- Cartography for supporting
 - computation
 - communication
- Evolution of knowledge
- Zoommm project, planetmde.org: Jean-Marie Favre (LIG/ADELE)
- For more information: J.S. Sottet's PhD. J.S. Sottet is the author of most of these slides.

- Capitalization
- No gap between the designer and the end-user
- Powerful approach

