MBUI XG

Work and Results

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Prepared by: José M. Cantera (jmcf@tid.es)

MBUI – XG Overview

- Main Founders (October 2008)

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ISTI
ISTITUTO DI SCIENZA E TECNOLOGIE
DELL'INFORMAZIONE "A. FAEDO"

UCL
Université
catholique
de Louvain

Fraunhofer

- Chair: Dave Raggett

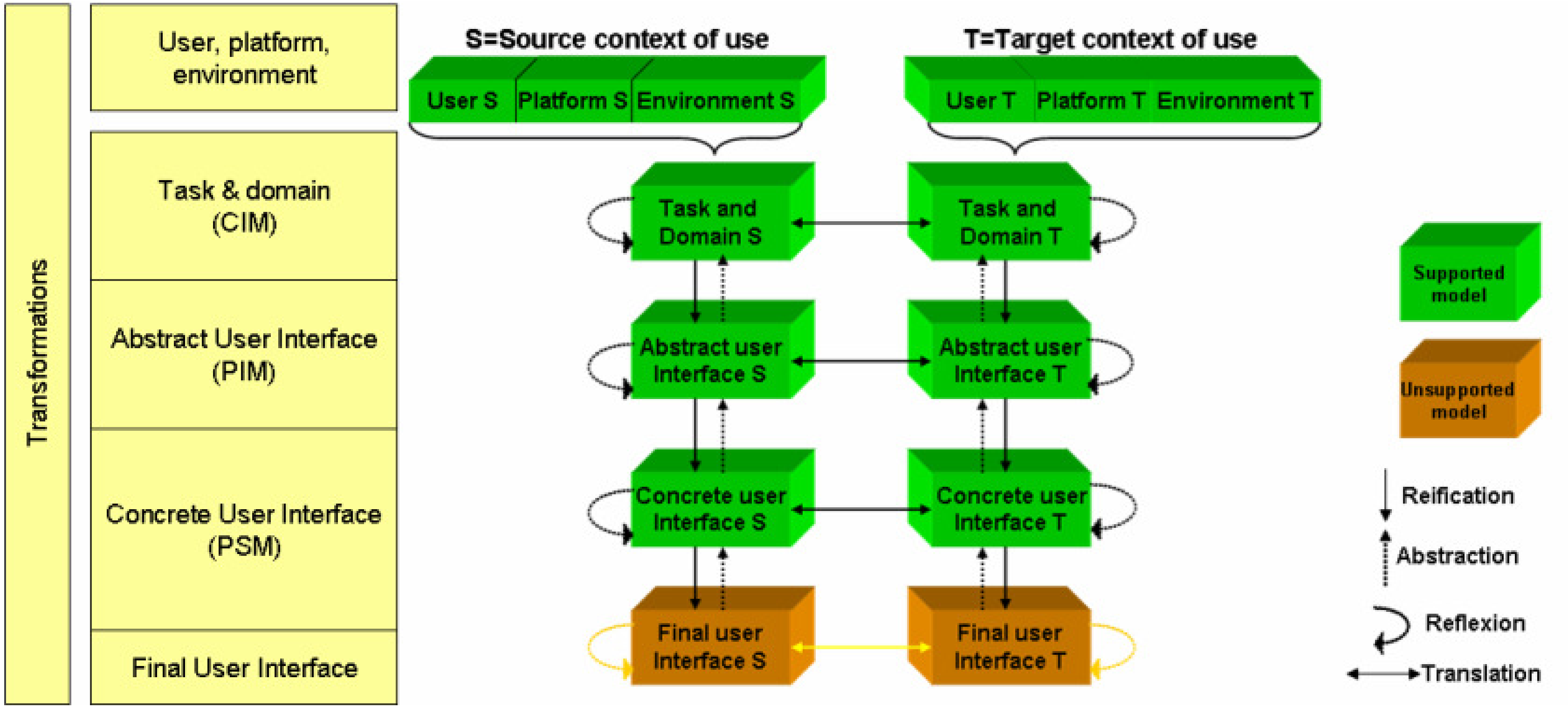
W3C®

- Mission
  - to evaluate research on model-based user interface design as a framework for authoring Web applications and with a view to proposing work on related standards

Cameleon

- Reference Framework
    - for enabling the development of UIs supporting multiple targets, or multiple contexts of use in the field of context-aware computing
- Principles
    - **Model-Based** approach
    - Coverage of both the **design** and **run-time** phases of a multi-target UI
- Promotes a **four-step forward engineering** development path starting with domain concepts and task modeling.

Cameleon : Abstraction Levels

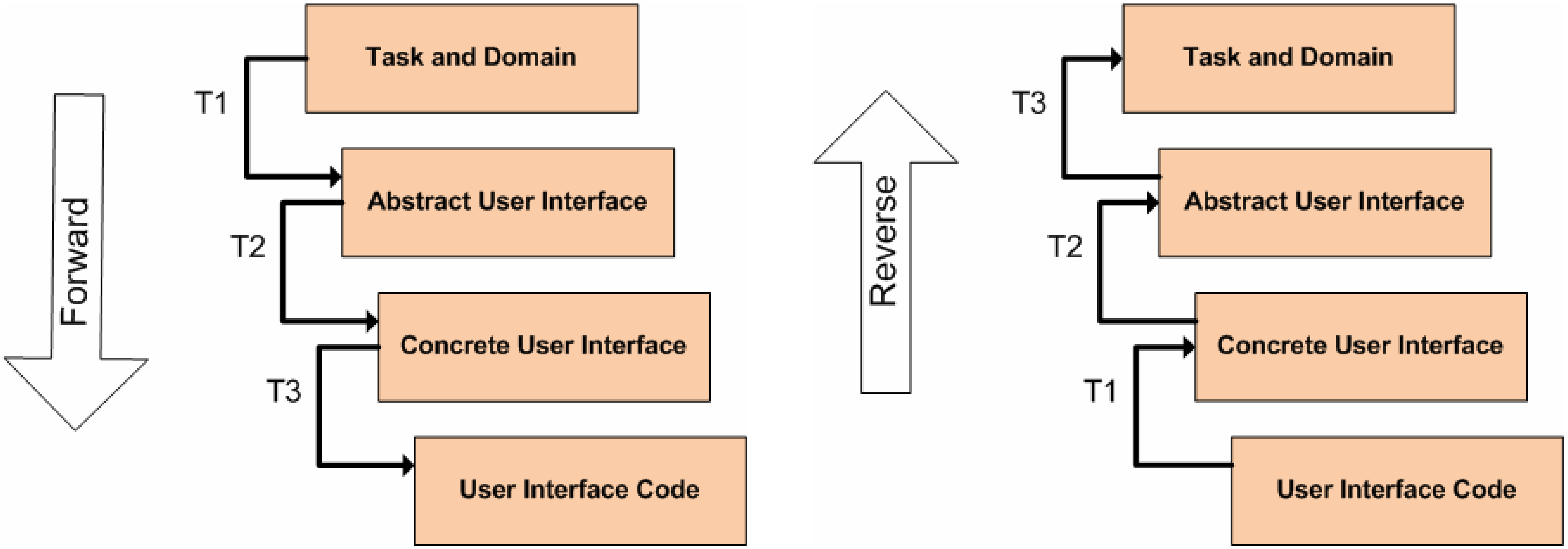


UIDL

- A formal language used in HCI in order to describe a particular UI independently of any implementation technology

- A UIDL is defined by :
  - **Semantics** : UML2, OWL2, …
  - **Abstract Syntax** : Independent of any representation language
  - **Concrete Syntax/es** : XML, RDF …
  - **Stylistics** : graphics …

Development Paths



Forward

T1

T2

T3

Task and Domain

Abstract User Interface

Concrete User Interface

User Interface Code

Reverse

T3

T2

T1

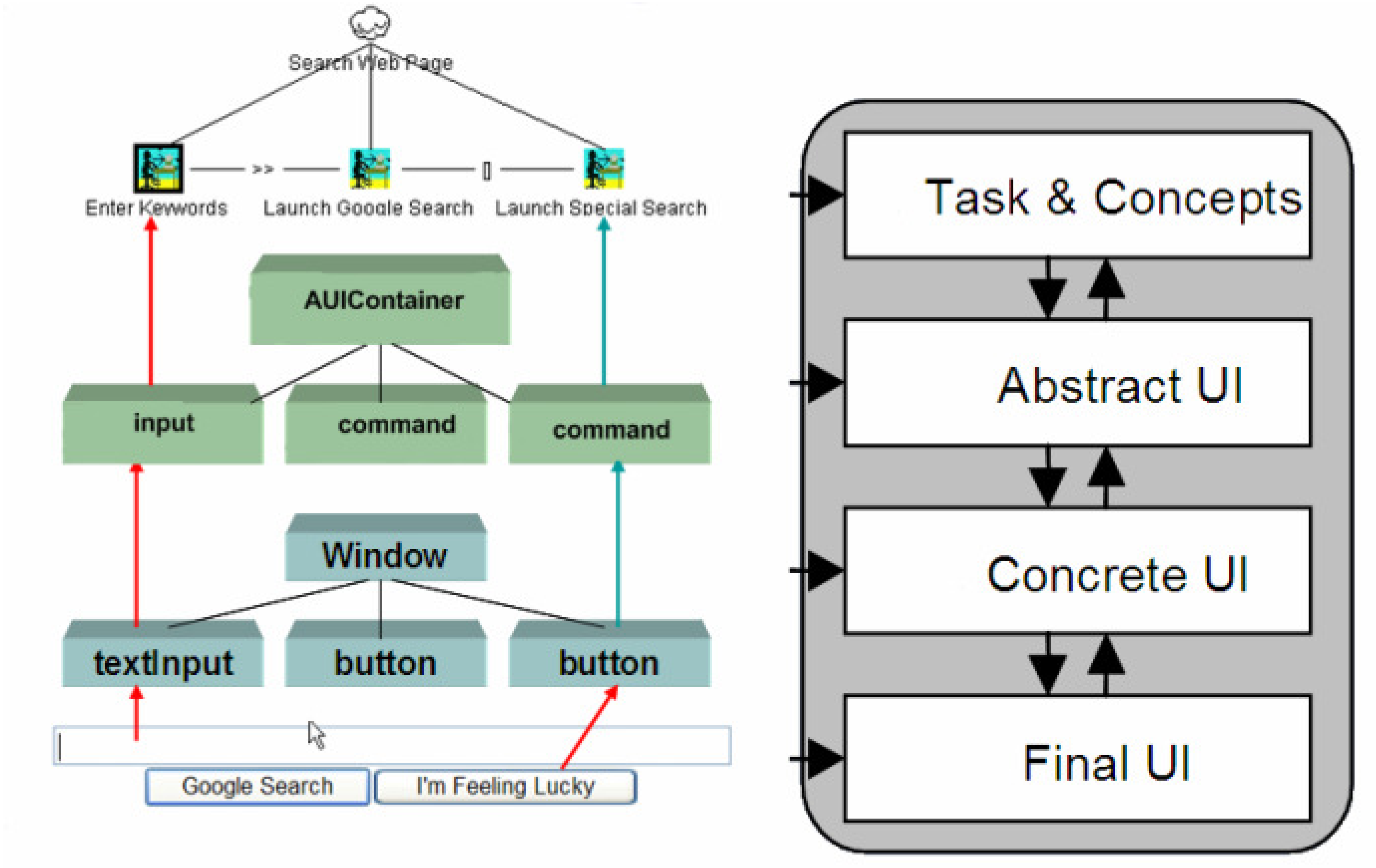
Task and Domain

Abstract User Interface

Concrete User Interface

User Interface Code

Example


Search Web Page
Enter Keywords
>>
Launch Google Search
[]
Launch Special Search
AUIContainer
input
command
command
Window
textInput
button
button
Google Search
I'm Feeling Lucky
Task & Concepts
Abstract UI
Concrete UI
Final UI

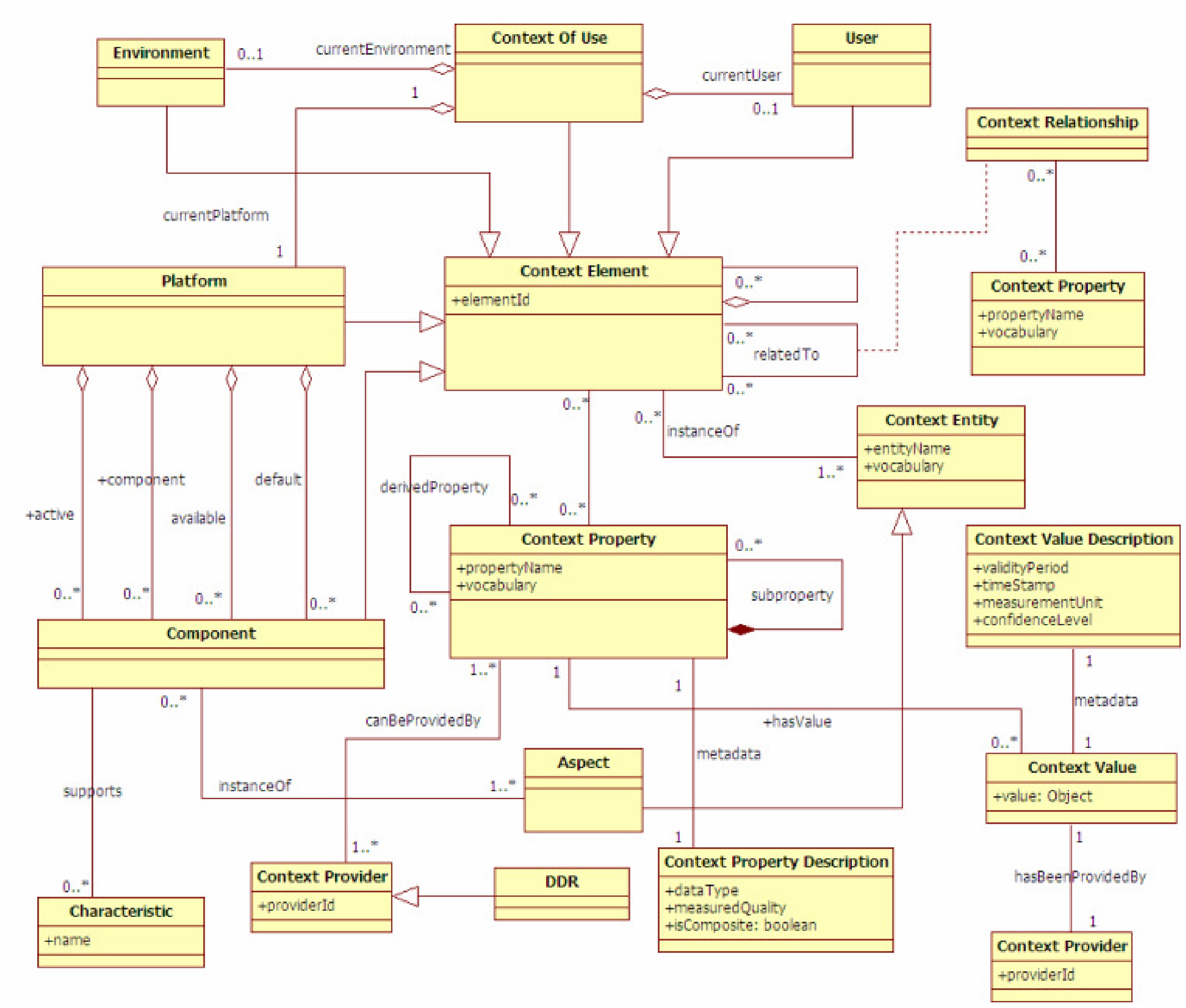
Cameleon : Context of Use

- The **Context of Use** of an interactive system is a dynamic, structured information space that includes the following entities:
  - a model of the **User**, U
  - a model of the **Platform**, P
  - a model of the social and physical **Environment**, E, where the interaction is actually taking place.
- A context of use is a triple composed by **(U, P, E)**

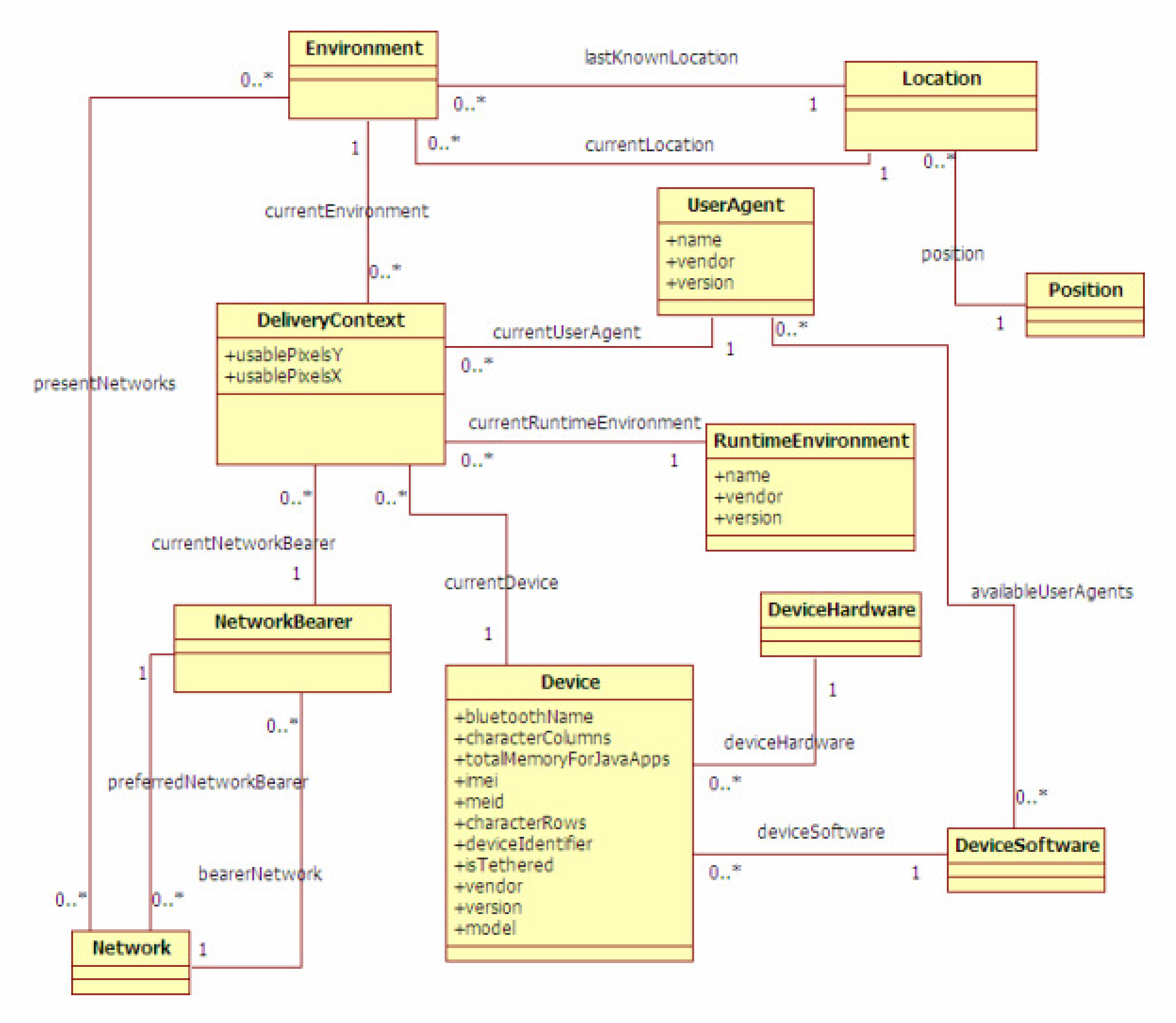
Context of Use and UIs

- **Multi-target** (or multi-context) UI
  - supports multiple types of users, platforms and environments.
- **Adaptive** UI
  - It is aware of the context of use and capable to (automatically) react to changes of this context in a continuous way Adaptable UI
- **Adaptable** UI
  - can be tailored according to a set of predefined options. normally requires an explicit human intervention.
- **Plastic** UI
  - multi-target UI that preserves usability across multiple targets.

Context Model (NEXOF-RA)



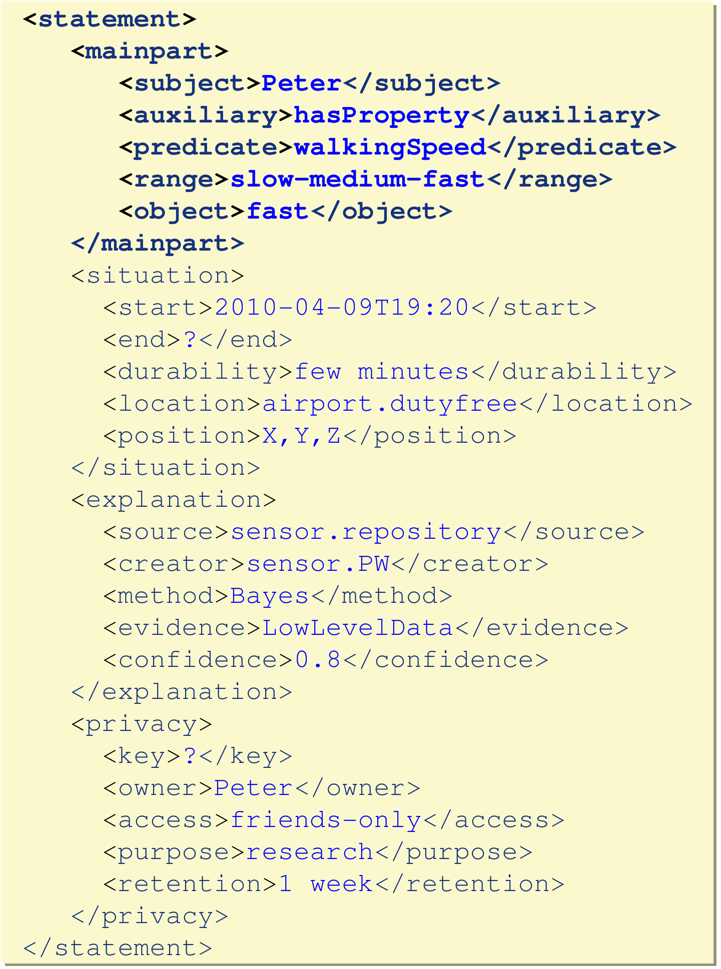
Platform Model : W3C’s DCO



GUMO and UserML

- Proposed by Dominikus Heckmann (DFKI) in order to deal with the problem of representing generic user models.

Example



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      <auxiliary>hasProperty</auxiliary>
      <predicate>walkingSpeed</predicate>
      <range>slow-medium-fast</range>
      <object>fast</object>
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   <situation>
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     <durability>few minutes</durability>
     <location>airport.dutyfree</location>
     <position>X,Y,Z</position>
   </situation>
   <explanation>
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     <creator>sensor.PW</creator>
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     <evidence>LowLevelData</evidence>
     <confidence>0.8</confidence>
   </explanation>
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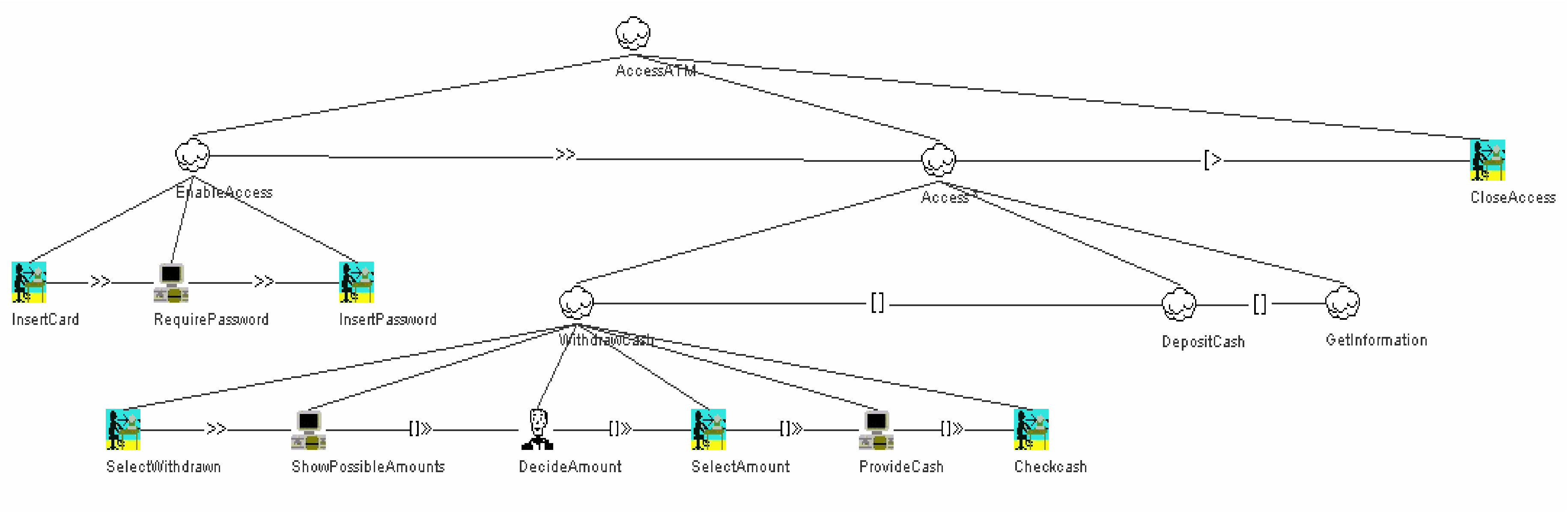
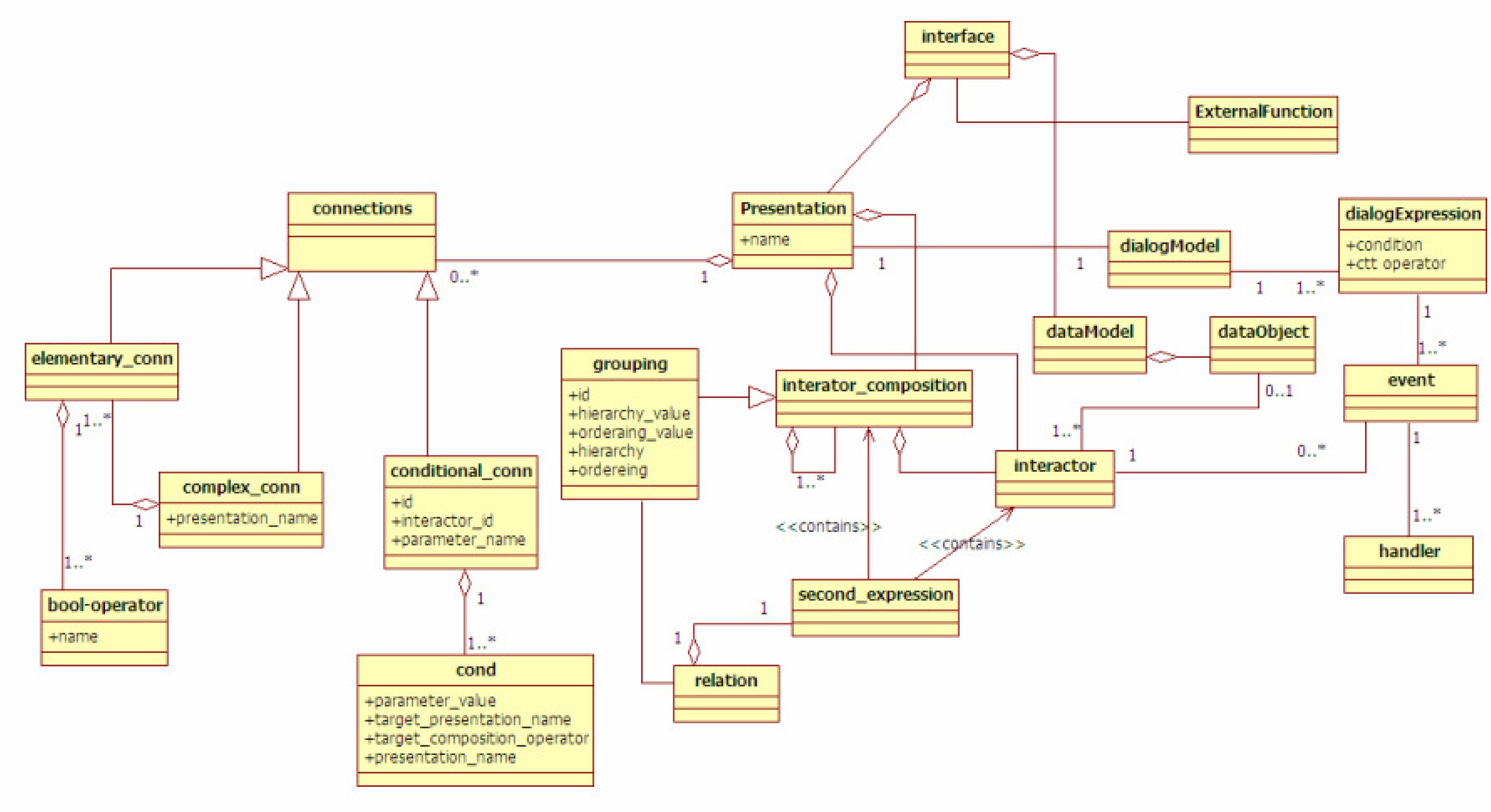
     <owner>Peter</owner>
     <access>friends-only</access>
     <purpose>research</purpose>
     <retention>1 week</retention>
   </privacy>
</statement>
```

Task Models : CTT

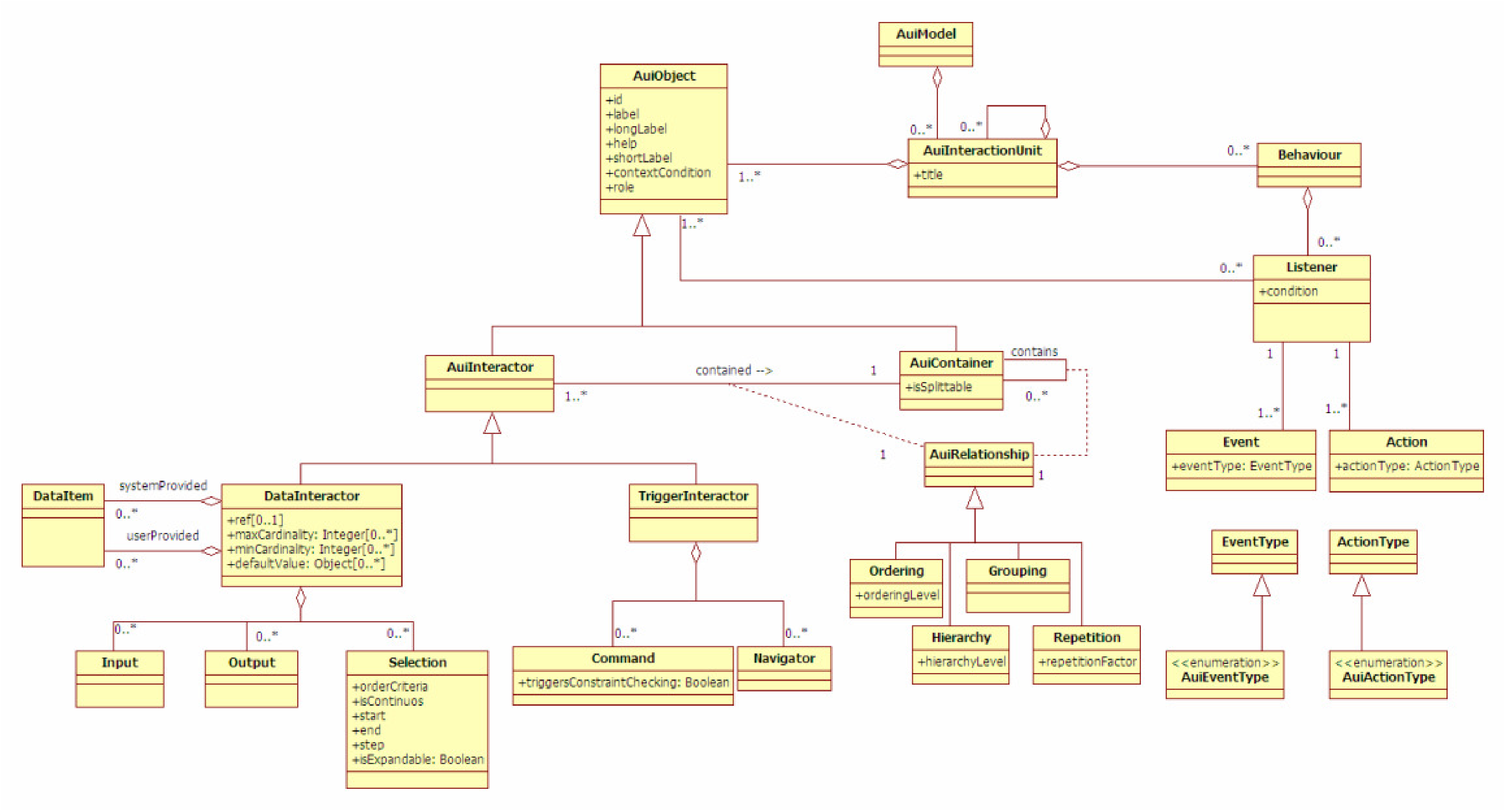
Example



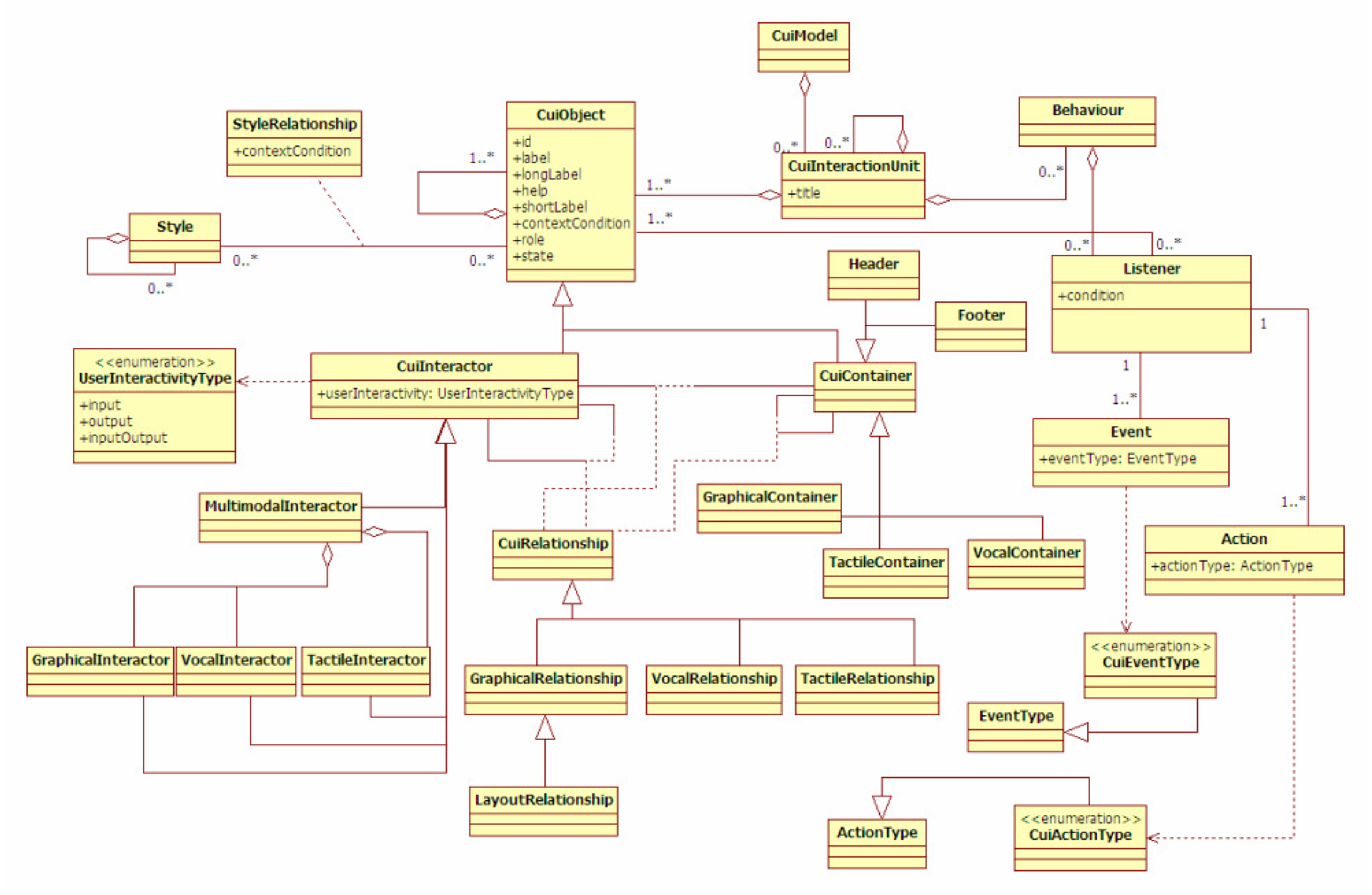
AUI Models : MARIA



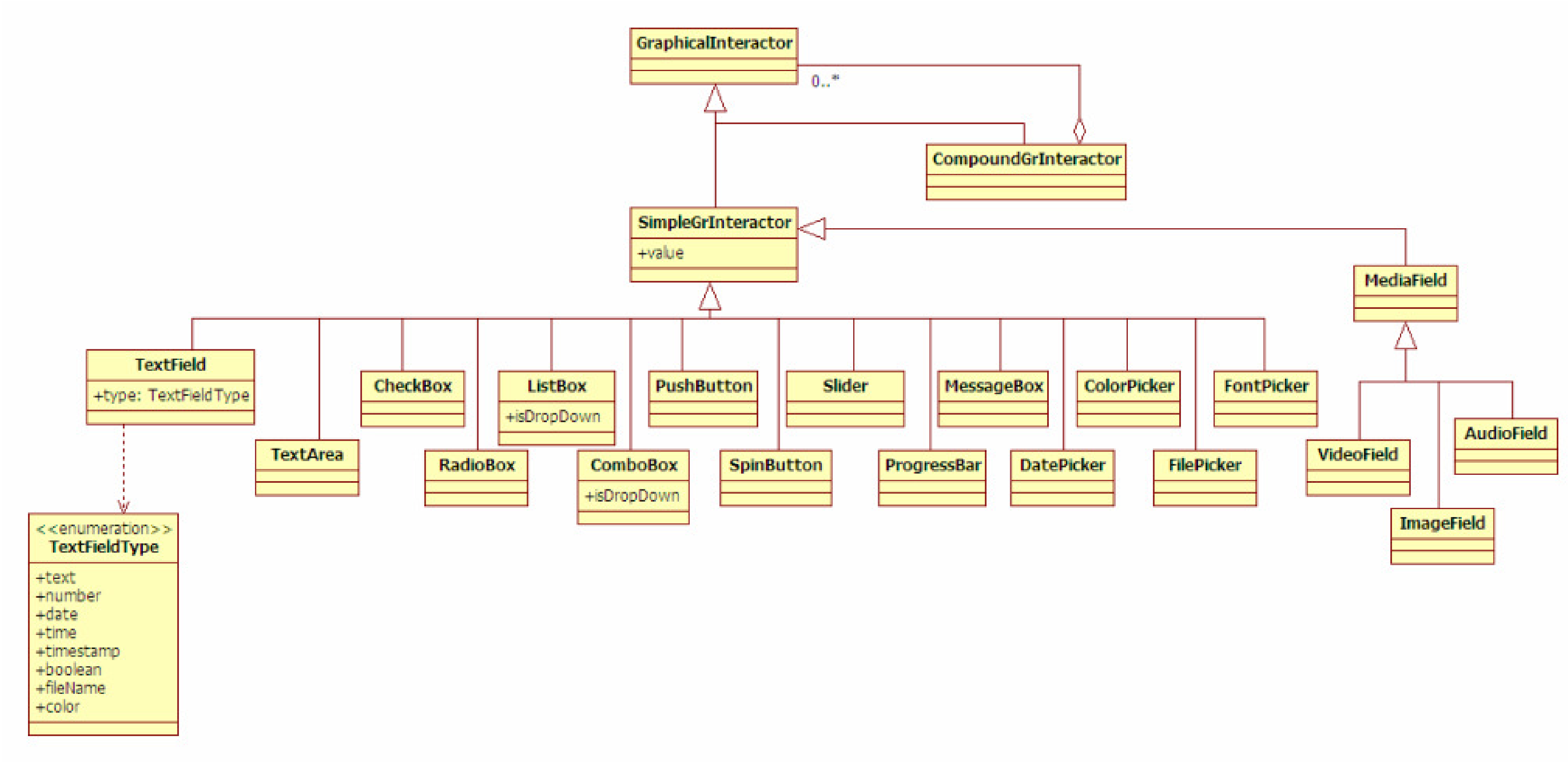
AUI Models : UsiXML (Draft)



CUI Models : UsiXML (I) (incomplete draft)



CUI Models : UsiXML (II) (incomplete draft)



Benefits of MBUI Approaches

- **user-centered and UI-centered development** process based on high level abstractions,

- a **declarative approach** allowing developers to concentrate on what the application needs to do

- Models facilitate the creation of **multi target and context-sensitive** user interfaces

- Models can be used for **automatic code generation** thus enhancing productivity

Challenges for Deployment

- **Availability of authoring environments**
- **Mainstream Web Development**.
  - easy-to-be-learned
- **Standardization**
  - What, When?
- **Incremental Adoption**
  - From UIMLs to the whole Cameleon Framework
- **Flexibility**
  - Modularity
- **Simplicity without losing powerfulness**
  - Making everyday developer’s life easier
- **Interoperability**
  - E.g. XForms

Suggested Standardization Work Items (I)

- to start with the definition of the **baseline meta-models and semantics** for the different abstraction layers (Task & Concepts, AUI, CUI).
  - It is quite more difficult to get an agreement on a common syntax than on common meta-models and semantics
  - it will enable an **incremental** (and interoperable) **adoption** by software vendors that currently own XML-based languages for describing UIs.
  - Once Models are widely adopted *a future action might consider the standardization of a common abstract or concrete syntax*

Suggested Standardization Work Items (II)

- **Unified Reference Framework** for MBUI
  - Based on the Cameleon RF
- **Task Meta-Model** Recommendation
  - CTT and ANSI as starting points?
- **AUI Meta-Model** Recommendation
  - UsiXML & MARIA convergence
- **CUI Meta-Model** Recommendation
  - It can be difficult and time consuming
- **Context of Use Meta-Model** Recommendation
  - Leveraging the DCO

MBUI – XGR Contributors

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DELL'INFORMAZIONE "A. FAEDO"

UCL
Université catholique de Louvain
UNIVERSITAS CATHOLICA LOVANIENSIS SEDES SAPIENTIAE 1425

Fraunhofer

DFKI
Deutsches Forschungszentrum für Künstliche Intelligenz GmbH

PUC
RIO

W3C®

SAP