



# ConcurTaskTrees

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# Use of Task Models

- Improve understanding of the application domain
- Record the result of interdisciplinary discussion
- Support effective design
- Support usability evaluation
- Support the user during a session
- Documentation



# Task modelling

- Flexible and expressive notations with precise semantics
- Systematic methods able to indicate how to use information in the task models
- Availability of automatic tools to manipulate and use such information efficiently



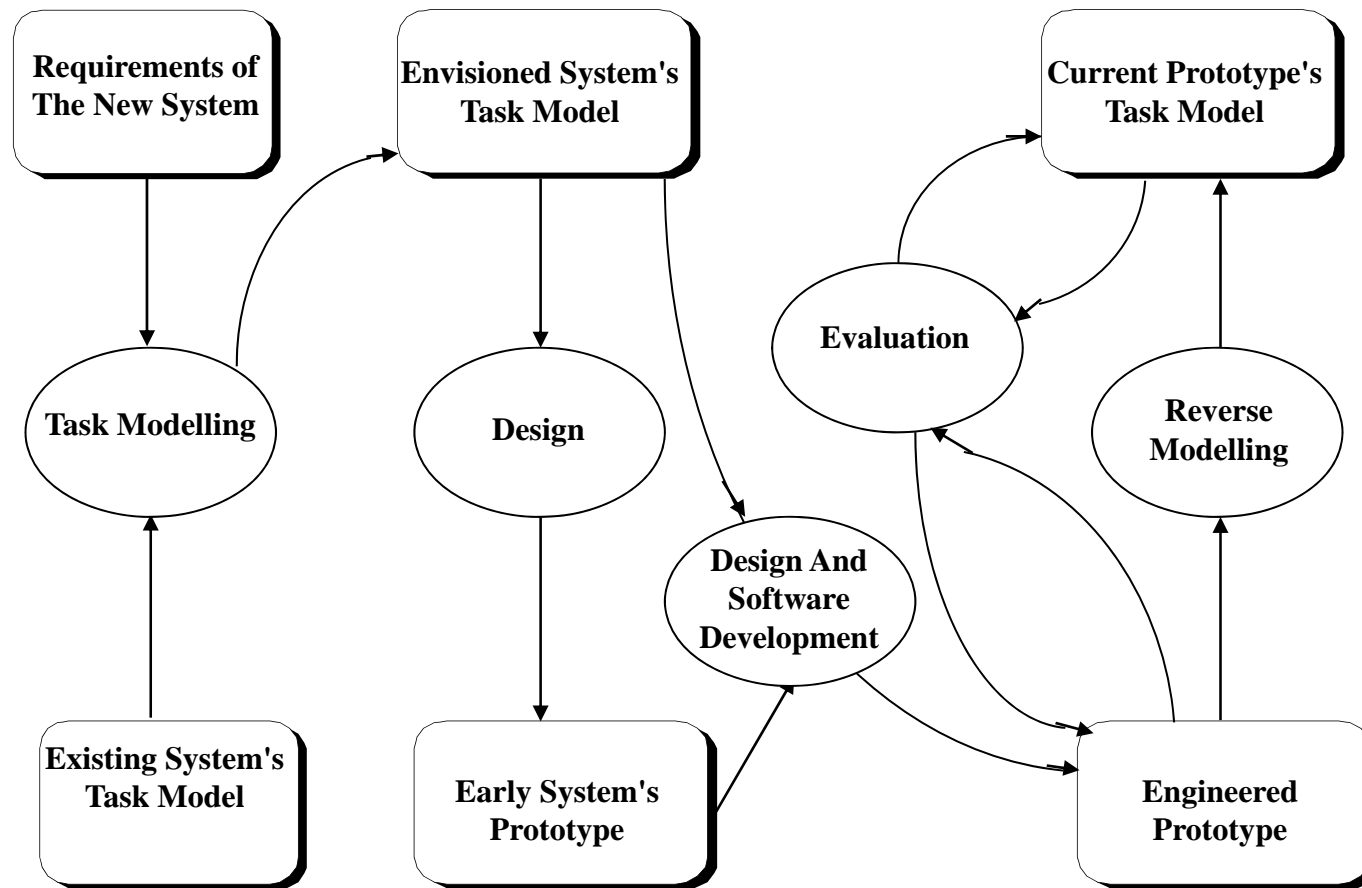
# Task Models

- They represent a synchronization point among users, designers, and developers
- They are high-level descriptions that can also be understood by people without programming background
- Provide precise requirements for the user interface software development as well.

# What task models can represent

- Task models can be represented at various abstraction levels
- The main high-level tasks are considered in requirements analysis
- When designers aim to provide precise design indications then the activities are represented at a small granularity
- The subject of a task model can be either an entire application or one of its parts
- The application can be either a complete, running interactive system or a prototype under development

# Use of task models in the design cycle

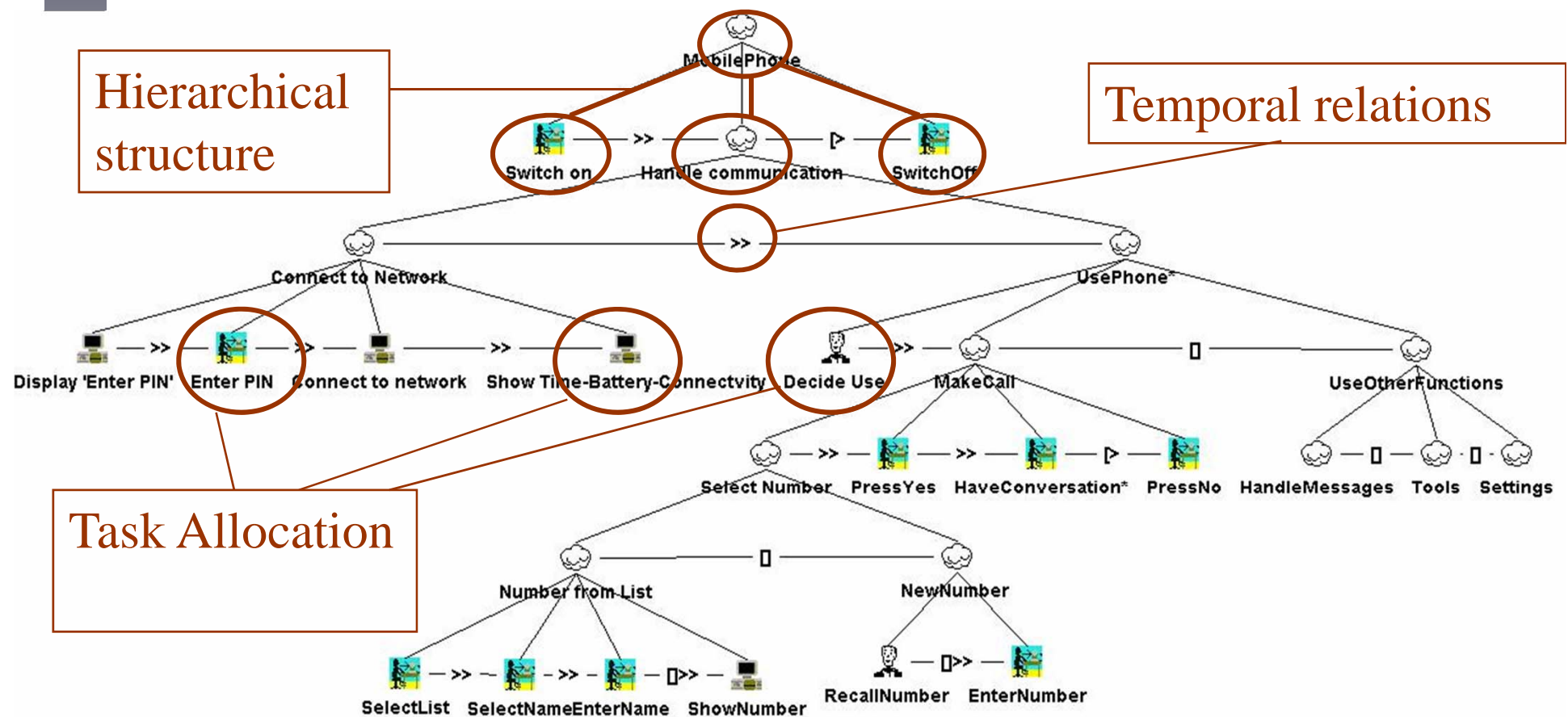




# CTT Evolution

- First Publication was INTERACT'97
- Widely used in Universities and Industries
- Various extensions proposed
- Applications in many domains (Web, safety critical systems, ERP, serious games, ...)

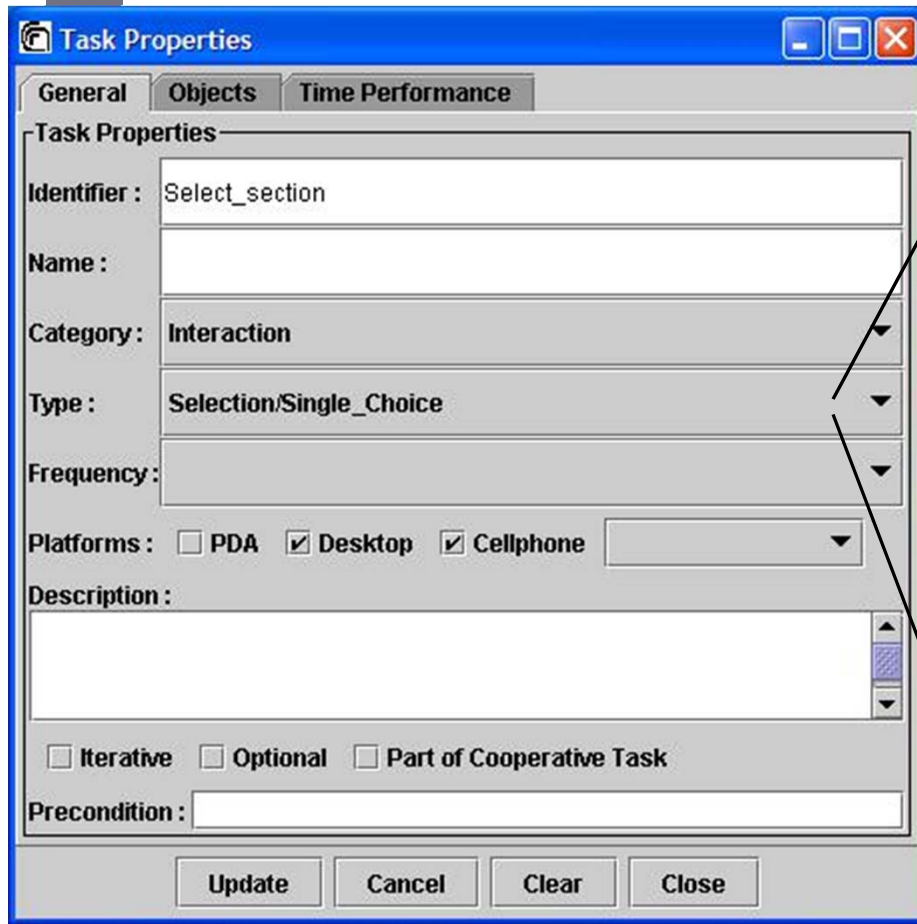
# The ConcurTaskTrees Notation



# Temporal operators

<i>Enabling</i>	$T1 \gg T2$ or $T1 [ ] \gg T2$
<i>Disabling</i>	$T1 [ > T2$
<i>Interruption</i>	$T1 / > T2$
<i>Choice</i>	$T1 [ ] T2$
<i>Iteration</i>	$T1^*$ or $T1_{\{n\}}$
<i>Concurrency</i>	$T1     T2$ $T1  [ ]  T2$
<i>Optionality</i>	$[T]$
<i>Order Independency</i>	$T1  =  T2$

# Task and attributes



**Task Properties**

General Objects Time Performance

Task Properties

Identifier : Select\_section

Name :

Category : Interaction

Type : Selection/Single\_Choice

Frequency :

Platforms : ☐ PDA ☒ Desktop ☒ Cellphone

Description :

☐ Iterative ☐ Optional ☐ Part of Cooperative Task

Precondition :

Update Cancel Clear Close

## Interaction tasks

Selection

Edit

Control

...

## Application task

Overview

Feedback

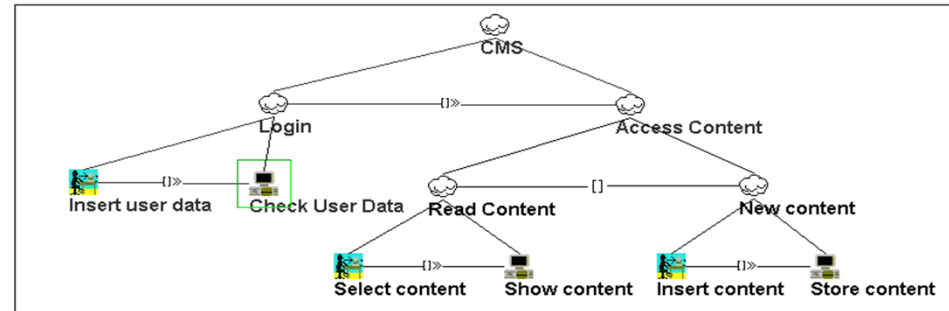
Generating alerts

Grouping

...



# PreConditions



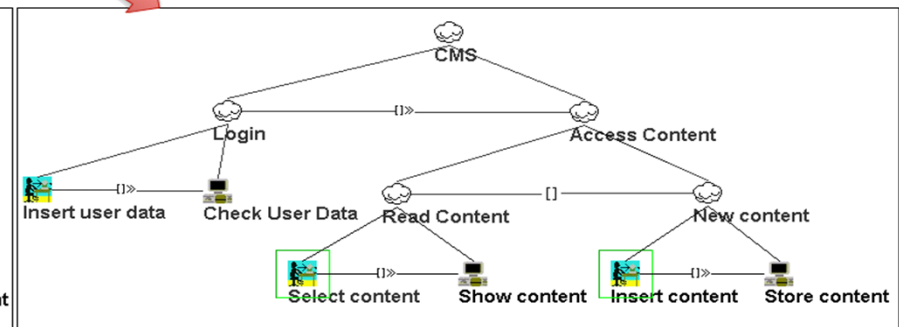
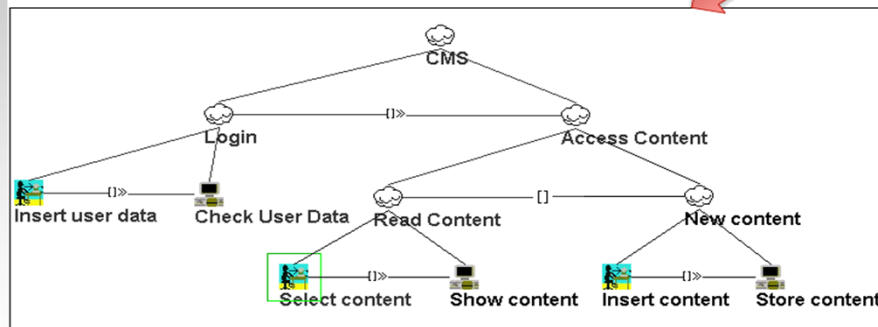
Evaluate Precondition for task [Insert content]

Press Yes if the precondition is true for this simulation, press No otherwise  
 $\text{identity.isAuth} = \text{TRUE AND identity.role} = \text{ADMIN}$

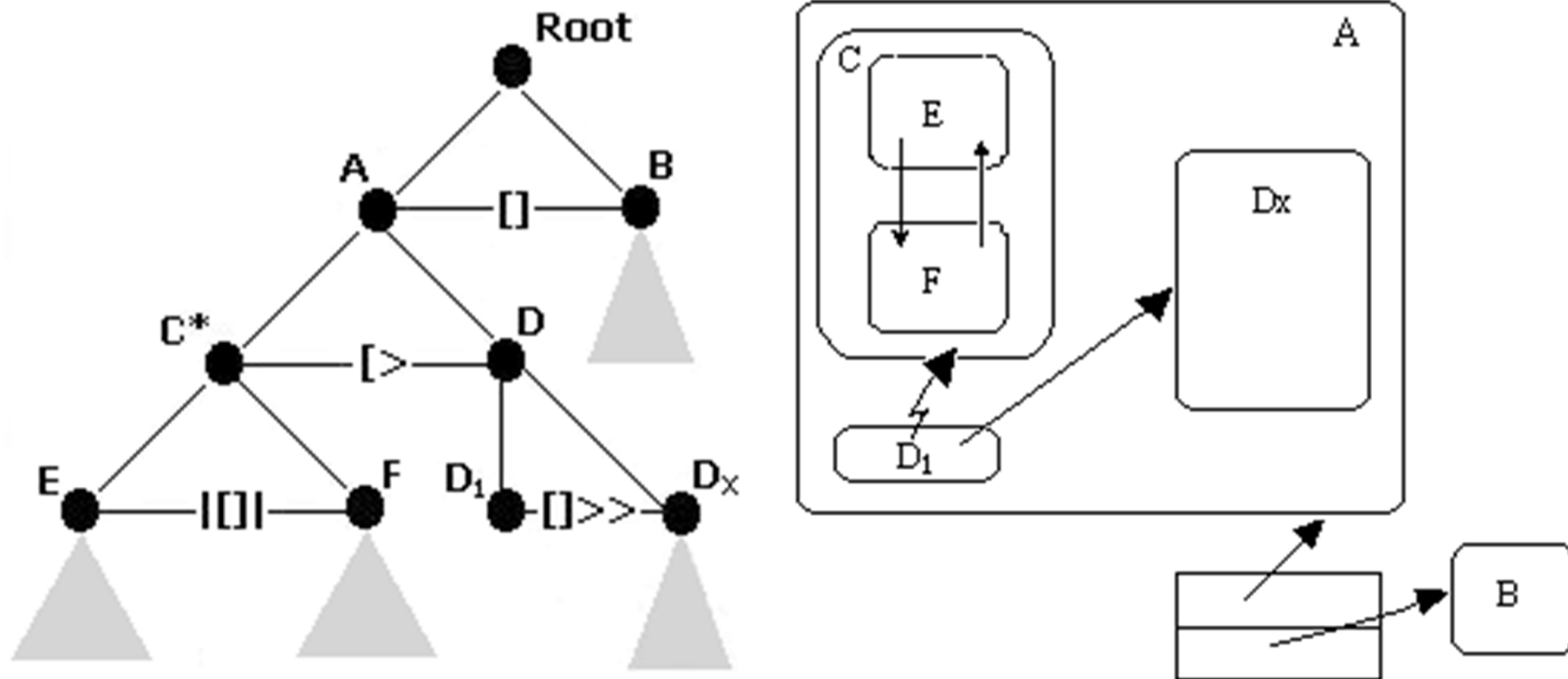
No Si

NO

YES

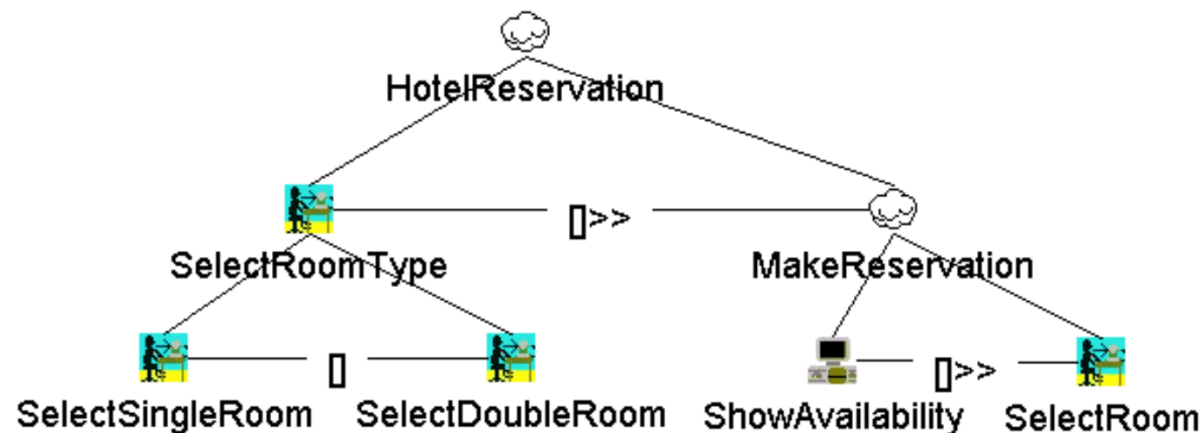


# Deriving info from temporal operators



# Presentation Task Sets

- Presentations indicate set of elements enabled at the same time
- Analysis of temporal operators to identify sets of tasks enabled at the same time



{SelectSingleRoom, SelectDoubleRoom}, {ShowAvailability}, {SelectRoom}

# Heuristics for PTSs

**Generate AUI wizard**

Current Presentation Task Sets  
Each set contains the tasks that will be presented at the same time

Presentation task sets

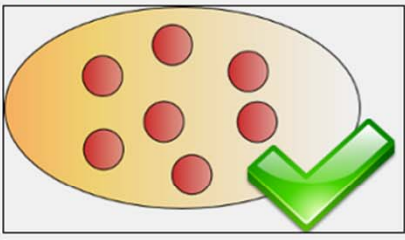
- Set 1: {Enter login UserName, Enter login Password}
- Set 2: {Invoke login}
- Set 4: {Output login parameters}
- Set 5: {Invoke getDeviceList}
- Set 7: {Output getDeviceList parameters}
- Set 8: {pick from device}
- Set 9: {Check dimmerlightbulb, Check thermostat, Check sensor, Check washingmachine, Check alarm, Check oven,}
- Set 10: {Enter Dimmerlightbulb\_setDimmer dimmerValue, Invoke Dimmerlightbulb\_isOn, Invoke Dimmerlightbulb\_getf}
- Set 11: {Invoke Dimmerlightbulb\_setDimmer}
- Set 13: {Output Dimmerlightbulb\_setDimmer parameters}
- Set 15: {Output Dimmerlightbulb\_isOn parameters}

Heuristic selection

Select the heuristic to apply

- ☐ Sharing most elements
- ☐ Single task sets
- ☐ Joining when enabling
- ☐ Highlight information exchange
- ☒ No heuristic

**No heuristic**



The current Presentation task sets fits the task model and no heuristic is needed.

Back Next Cancel

Switch view: CIT Service Environment  
Switch view: CIT Service Environment

**Task properties**

Identifier: HomeScenarioWSVersion2Service  
Category: abstraction  
Type: none  
Frequency: not defined  
Platform: not defined  
Description: none  
Time performance: not defined  
Precondition: none  
Objects: none  
Iteravite: false  
Optional: false  
Part of Cooperation: false

login

Execute login Output login parameters getDeviceList

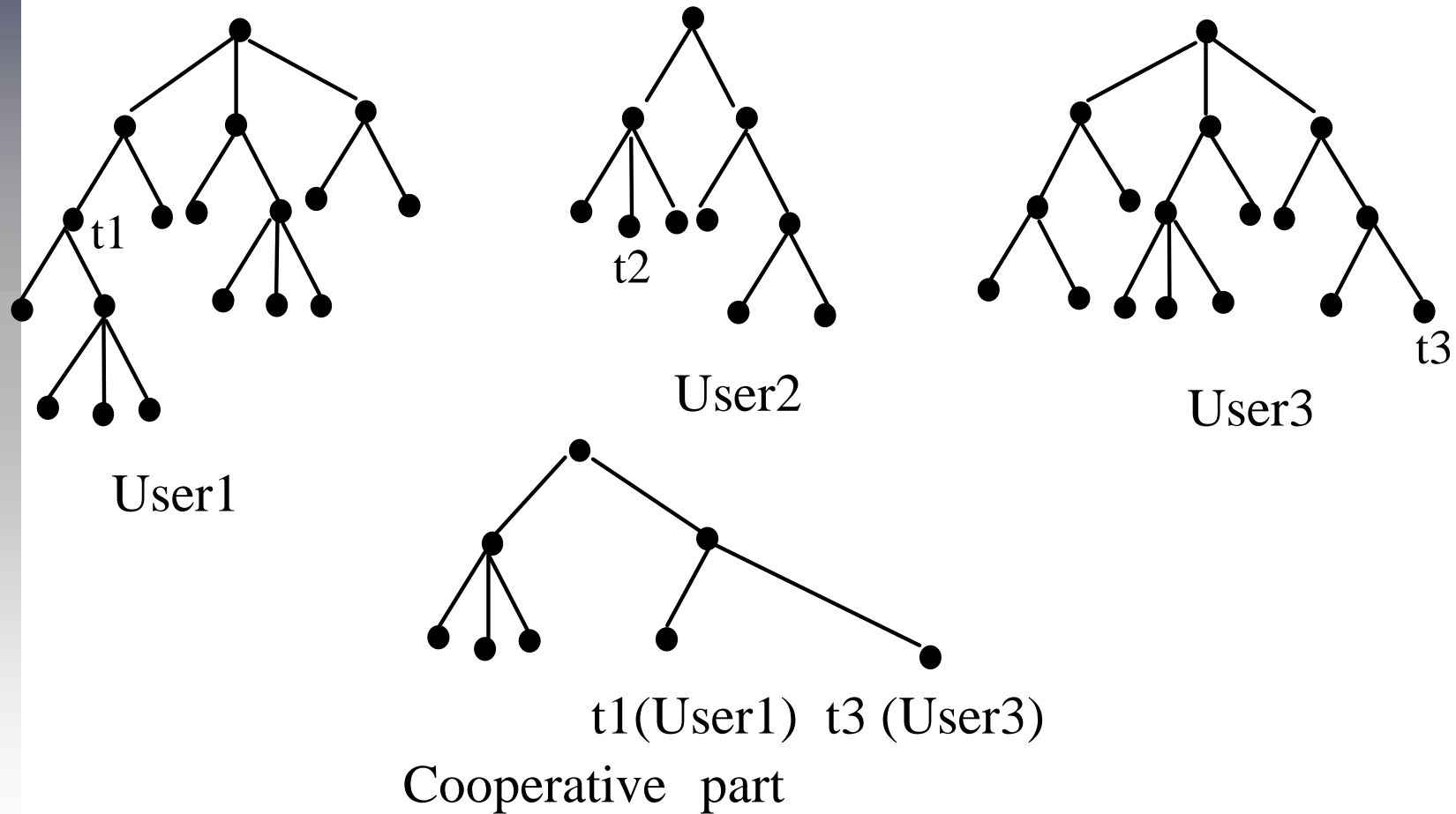
Invoke getDeviceList Execute getDeviceList Output

Check dim

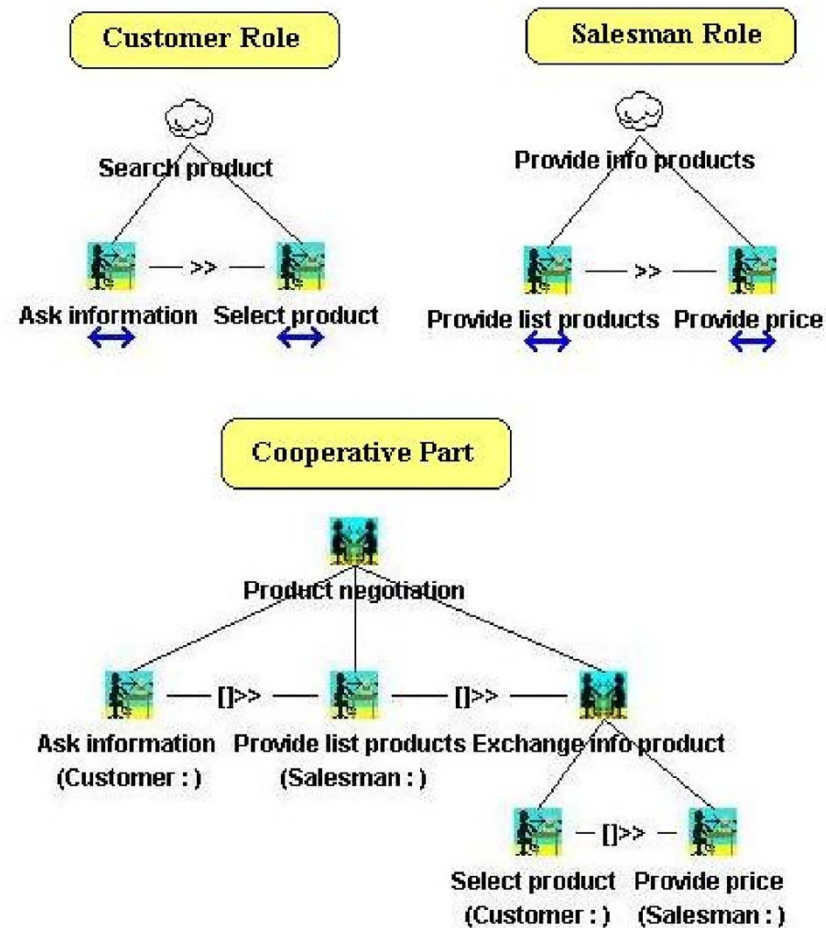
Dimmerlightbulb\_setDimmer

setDimmer Execute Dimmerlightbulb\_setDimmer Output Dimmerlig

# Modelling Multi-User Applications



# Cooperative aspects



# Comparison and goals

- More flexible than ANSI standard
- More interaction-oriented than BPMN and workflow notations
- Create standard, which can then push adoption,
- Possibility of building new tools for improved presentations and processing