



The Objectiver Tool

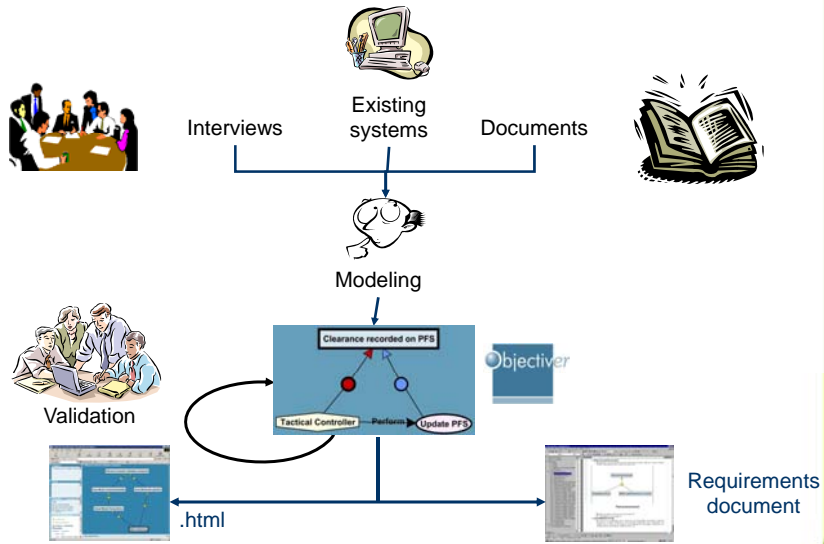


Outline

- Analysis process
- Objectiver components
 - Requirements model editor
 - Explorer
 - Diagram editor
 - Property editor
 - Text editor
 - Requirements model browser
 - Document generator
 - Requirements model checker
- The technical corner
- Industrial references

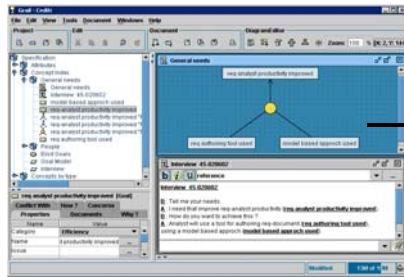


Analysis process



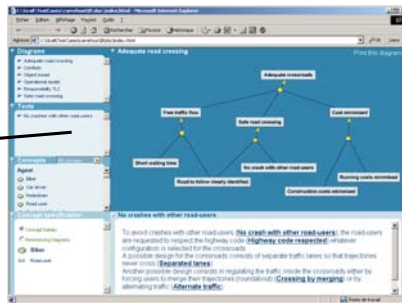
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Objectiver Components



Reqs Model editor

Document generator



Reqs model browser



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Reqs model editor

The screenshot shows the Reqs model editor interface. On the left is the **Explorer** (circled in red), which displays a hierarchical tree of model elements. Below it is the **Property editor**, which shows the properties of the selected element. On the right is the **Diagram editor**, which displays a graphical representation of the model elements and their relationships.

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Explorer

Package view: user-defined hierarchical view of all concepts and documents in the KAOS model.

The three screenshots illustrate the Package View functionality:

- Left screenshot:** Shows the Package View with several packages (folders) defined by the user, such as "Goal diagrams", "Interviews", "Object diagrams", "Reports", and "Responsibility diagrams".
- Middle screenshot:** Shows the Package View with the "Goal diagrams" package unfolded, displaying a list of goal diagrams.
- Right screenshot:** Shows the Package View with the same view as the middle screenshot, but filtered to show only the "Goal diagrams" package.

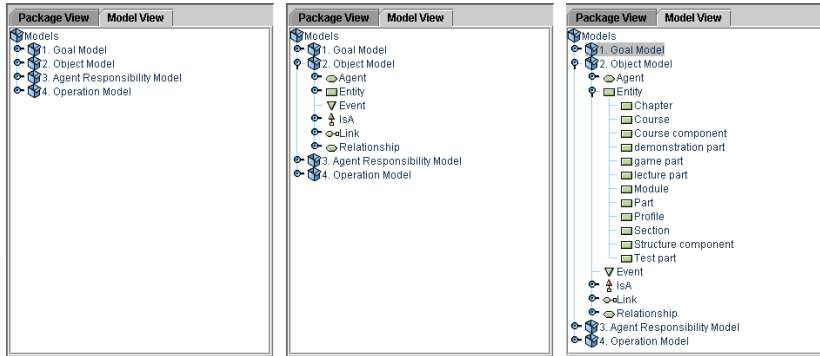
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Explorer (II)

Model view: view on the concepts in the KAOS model, sorted by model type and concept type (the package structure is fixed)



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Packages (= folders) for model types

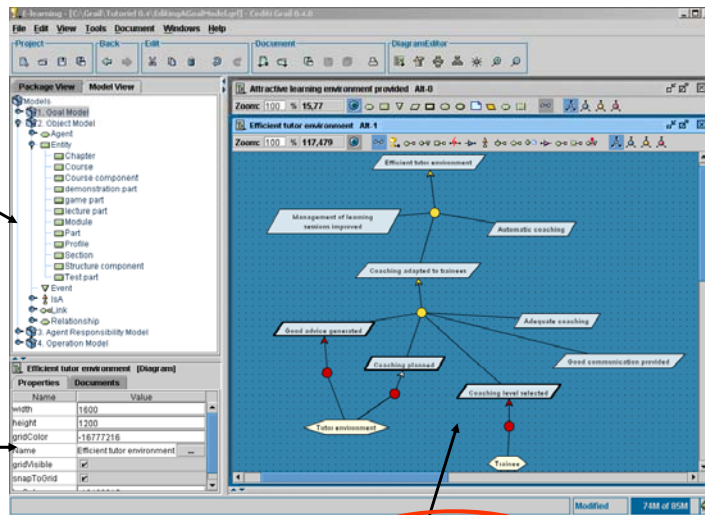
Packages for concept types

Concept list (leaves) sorted alphabetically

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Reqs model editor



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Explorer

Property editor

Diagram editor

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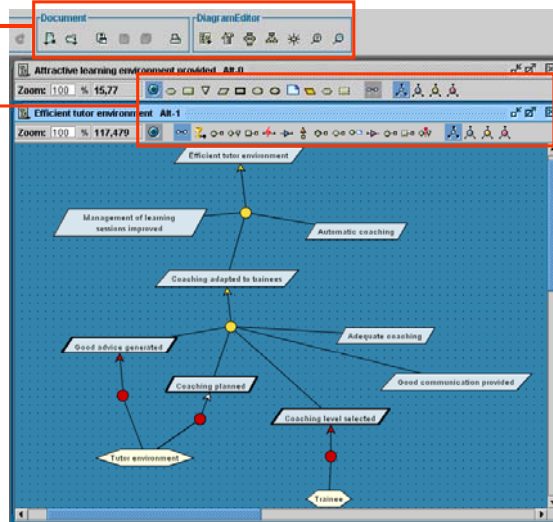
8

Diagram editor

Edit functions

Palette

Drawing zone

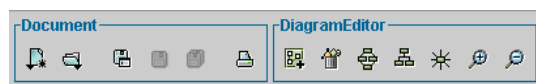


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Diagram edit functions



- New
- Open
- Save
- Print
- Layout
- Delete existing concept
- Add existing concept
- Zoom

KAOS diagrams are Objectiver documents.

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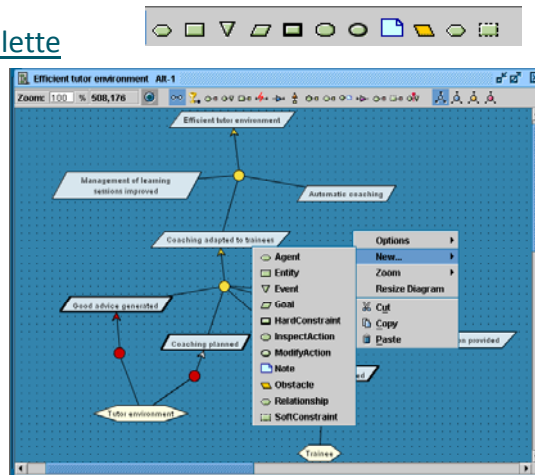
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Concept insertions in a diagram

New concept:

use the concept palette

or use the contextual pop-up menu



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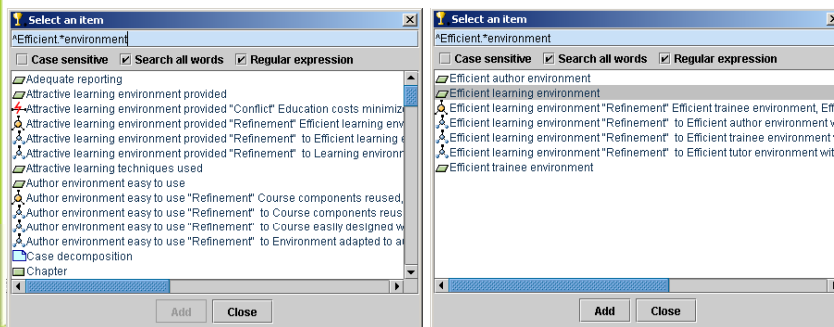
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Concept insertion in diagrams (II)

Existing concept: drag&drop from the explorer

add-existing dialog



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support regular expressions & auto-completion

12



Insertion of relationships between concepts in diagrams



• New relationship:

use the binary relationship palette



(a.o., association, conflict, isA, input, link, output, stop,...)

or the and-or relationship palette



(operationalization-blue, refinement-yellow, responsibility-red)

• Existing relationship:

- drag&drop from the explorer
- add-existing dialog



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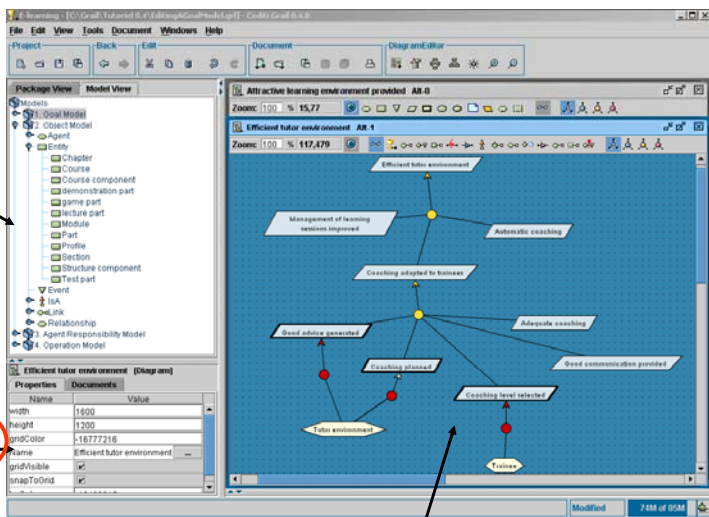
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Reqs model editor



Explorer

Property editor

Diagram editor

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Property editor

- Edition of values for concept properties

The list of properties depends on the concept type.

Predefined property list

Name	Value
Issue	...
Priority	Medium
Category	Efficiency
Name	Efficient tutor environment
Pattern	Achieve
InformalDef	...
FormalDef	...

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Property editor (II)

- Edition of user-defined object attributes

Only available for the object model.

User-defined attribute list

Name	Type
title	String

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Property editor (III)

- Concept location

Tutor environment [Agent]		
Operationalizing	Known By	Specialized In
Specializes	Knows	Linked To
Concerned By	Performs	Responsible For
Capable Of	Input Of	Output Of
Properties	Attributes	Documents
Document		
Trainee knowledge improved		Open
Efficient tutor environment		Open
Tutor environment (Responsibility Graph)		Open

Documents can be opened this way.

The documents tab shows the list of Grail documents in which the concept appears.

Property editor (IV)

- Concept neighbourhood

Each tab shows a list of related concepts

father goal(s)

subgoals

conflicting goals

Attractive learning environment provided [Goal]				
Conflicts With	Concerns			
Properties	Documents	Why ?	How ?	
Link				
Learning efficiently organized				

Attractive learning environment provided [Goal]				
Conflicts With	Concerns			
Properties	Documents	Why ?	How ?	
Link				
Refinement2				
Learning environment easy to use				
Efficient learning environment				

Attractive learning environment provided [Goal]				
Conflicts With	Concerns			
Properties	Documents	Why ?	How ?	
Link				
Education costs minimized				

Reqs model editor

Explorer

Text editor

Property editor

Diagram editor

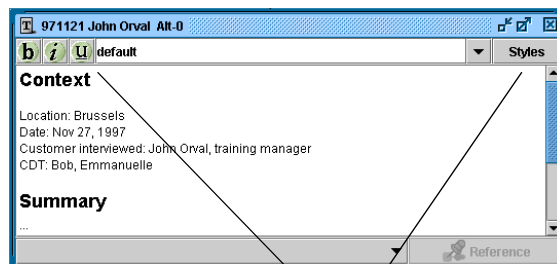
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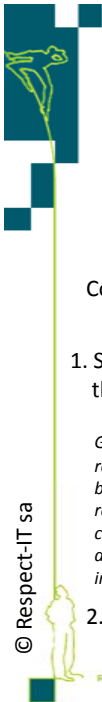
19

Text editor

Text documents can be introduced in the model, e.g., interview summaries:



Minimal formatting rules for characters and paragraphs are provided.



Text editor (II)



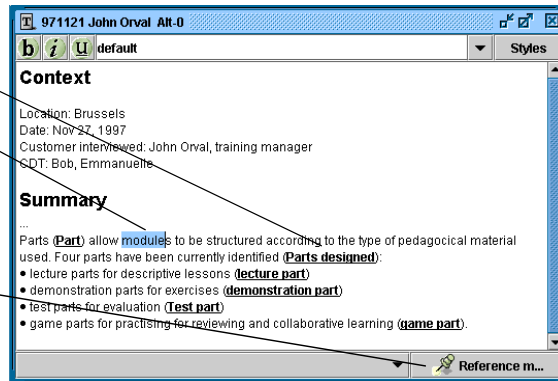
References to concepts already existing in the model can be inserted (↻ traceability) by marking strings corresponding to concept names

Concept references

1. Select the string 'module'

GRAIL enables concept reference creation because 'module' is recognized as a concept name already existing in the model

2. Push Reference m...



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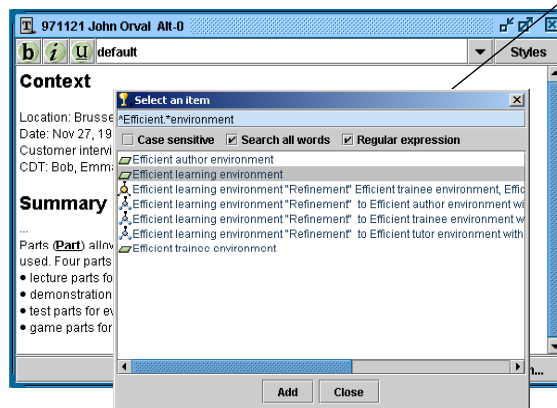
21



Text editor (III)



References to concepts already existing in the model can also be inserted (↻ traceability) by invoking the add-concept dialog



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Text editor (IV)



Simultaneous concept creation and reference creation (👉 traceability).

1. Select a string

2. Select a concept type in the list

Not yet enabled as the selected string does not correspond to the name of an existing concept

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Text editor (IV)



Simultaneous concept creation and reference creation (👉 traceability).

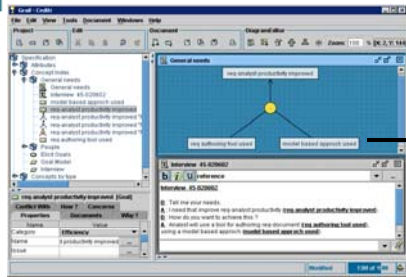
3. Create the entity and insert a reference

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24



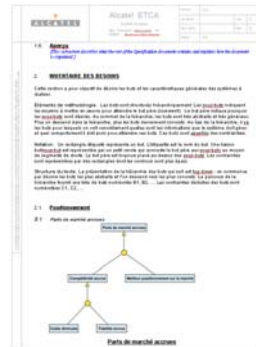
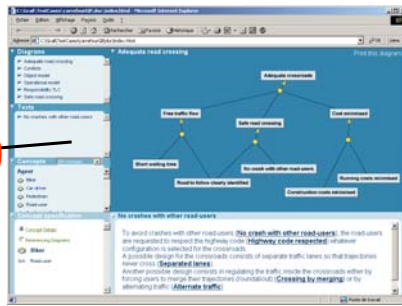
Objectiver Components



Reqs model editor

Document generator

Reqs Model browser



Reqs model browser



Indexes

Property viewer

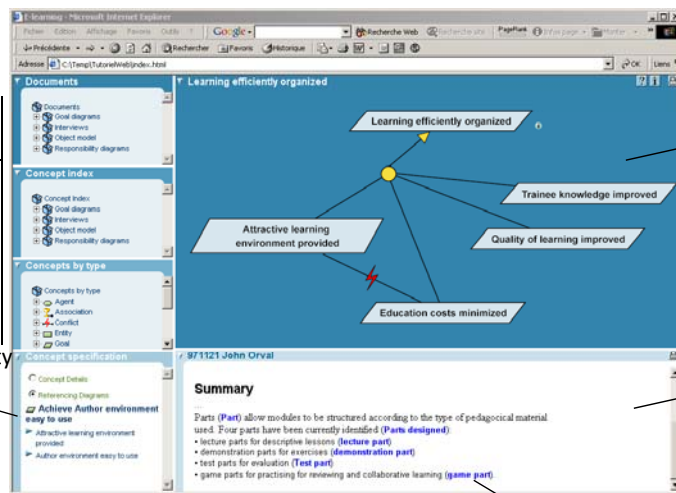



Diagram viewer

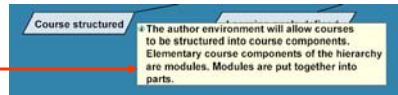
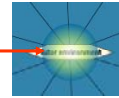
Text viewer

Concept references are hyperlinks.

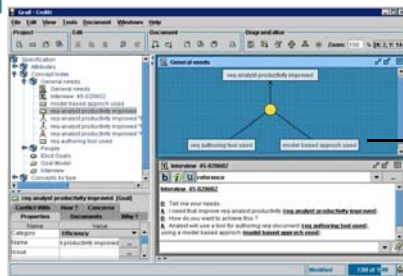
Reqs model browser (II)



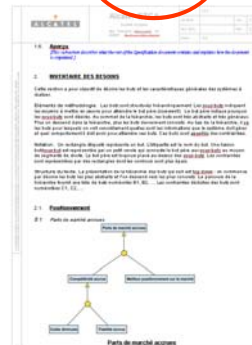
- Only requires  and the SVG free plug-in of Adobe to work.
- Read-only
- Ideal for communicating about the model
- Often used during validation meetings
- Easy navigation through the model by clicking on diagrams and following hyperlinks
- Zoom in, zoom out, locator functions
- Pop-up visualisation of properties (issue, informal definition)



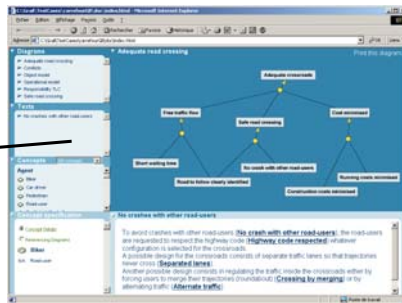
Objectiver Components



Reqs model editor



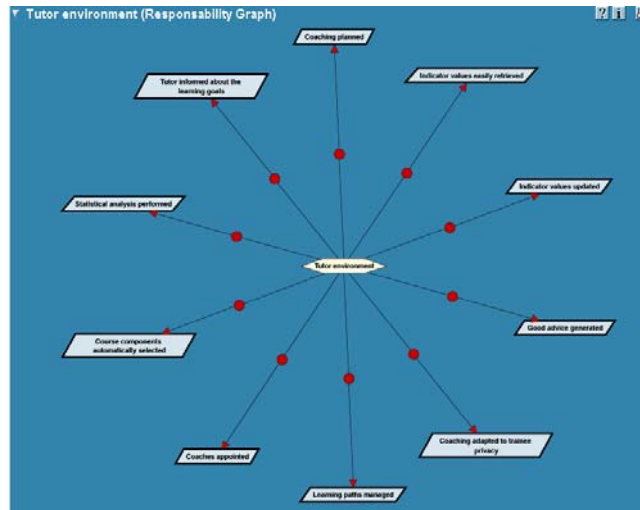
Reqs Model browser



Document generator

Diagram generator:

Responsibility model generated from goal diagrams by consolidating all responsibility relationships, agent by agent.



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Document generator (II)

- Report generation available:
 - for individual diagrams
 - for all diagrams in a package
 - for all packages
 - ‘à la carte’ (manually composed)
 - according to standard templates (IEEE830)
 - according to templates customised to company standards
- 2-step process:
 - Create an explanation (= sequence of GRAIL documents)
 - Export the explanation (RTF, PDF)

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Document generator (III)



Object model and related interview AR-3

971121 John Orval

Course

Object model and related interview AR-3

Context

Location: Brussels
Date: Nov 27, 1997
Customer interviewed: John Orval, training manager
CDT: Bob, Emmanuelle

Summary

Parts **Part** allow modules to be structured according to the type of pedagogical material used. Four parts have been currently identified (**Parts designed**):

- lecture parts for descriptive lessons (**lecture part**)
- demonstration parts for exercises (**demonstration part**)
- test parts for evaluation (**Test part**)
- game parts for practising for reviewing and collaborative learning (**game part**)

Diagram showing relationships between Course, Profile, and Course component.

An explanation is an editable GRAIL document that contains a sequence of other GRAIL documents

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31

Document generator (IV)



Context

Location: Brussels
Date: Nov 27, 1997
Customer interviewed: John Orval, training manager
CDT: Bob, Emmanuelle

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Diagram showing relationships between Course, Profile, and Course component.

Explanation exported to RTF

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32



Document generator (V)



IEEE Computer Society Std 830-1998

IEEE Recommended Practice for Software Requirements Specification

1. Introduction
 - 1.1 Purpose
 - 1.2 Scope
 - 1.3 Definitions, acronyms and abbreviations
 - 1.4 References
 - 1.5 Overview
2. Overall Description
 - 2.1 Product Perspective
 - 2.2 Product Function
 - 2.3 User Characteristics
 - 2.4 Constraints
 - 2.5 Assumptions and Dependencies
 - 2.6 Apportioning of requirements
3. Specific Requirements

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33



Document generator (VI)



GRAIL IEEE-830 template:

1. Introduction
 - 1.1 Document purpose
 - 1.2 System purpose
 - 1.3 Definitions, acronyms and abbreviations
 - 1.4 References
 - 1.5 Overview
 2. Overall Description
 - 2.1 System perspective
 - 2.2 User requirements
 - 2.3 User characteristics
 - 2.4 Constraints
 - 2.5 Assumptions and Dependencies
 - 2.6 Apportioning of requirements
 3. System Requirements
- Generated according to the Object model
- Problem description: Goal model traversed from top to bottom
- Kaos assumptions & unresolved obstacles
- Requirements priority
- Solution description: use of Resp., Object & Operation models

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Document generator (VII)

Wizard for generating Reqs Doc explanations (in progress)



1. select generation rules for the goal model traversal part

spanning tree of the goal model

2. change the generation order if needed
3. generate an explanation

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Reqs-model checker

- Conformance to KAOS syntax checked on the fly in the diagram editor

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Reqs-model checker (II)



- Completeness checks
 - goals with no refinement (wishful thinking)
 - requirements with no agent responsible for
 - requirements with no operationalisation
 - ...
- Checks on the model quality
 - Concepts never appearing in a document
 - Concepts never appearing in a diagram
 - Incomplete concept definition
 - Concepts with a non-empty *Issue* attribute value
 - ...

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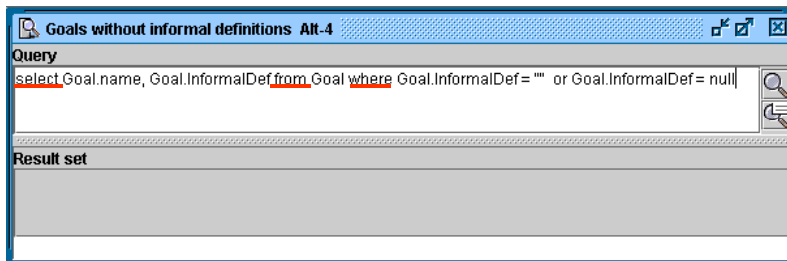


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Reqs-model checker (III)



- Checks using a query engine
- Queries in Object Query Language (OQL)
- Queries are treated as Objectiver documents
- Result sets are editable.



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38



Reqs-model checker (IV)



The screenshot shows a query tool window titled "Goals without informal definitions Alt-4". The query is: `select Goal.name, Goal.InformalDef from Goal where Goal.InformalDef = "" or Goal.InformalDef = null`. The result set is a table with two columns: "Goal.name" and "Goal.InformalDef". A dialog box titled "InformalDef" is open, showing the text "Parts must be designed in order to ...".

Goal.name	Goal.InformalDef
Trainees motivated to learn	
Learning paths managed	
Parts designed	Parts must be designed in order to ...
Efficient learning environment	
Automatic coaching	
Environment adapted to authors	
Learning environment easy to use	
Coaching planned	
Course components reused	
Adequate coaching	
Indicator values updated	
Parts logically chained	
Efficient author environment	
Author environment easy to use	
Trainee knowledge improved	
Management of learning sessions	

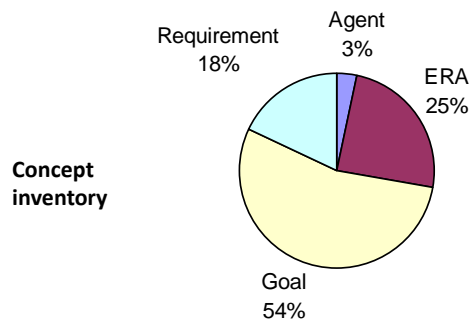
Annotations: "editable" points to the query field, and "Editable result set" points to the table.



Reqs-model checker (V)



Result sets can be exported to other applications, e.g., MS Excel to produce inventory charts:



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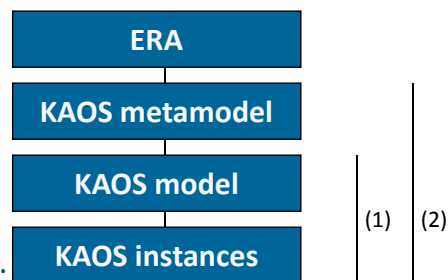
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The technical corner

- Objectiver is a meta-case tool



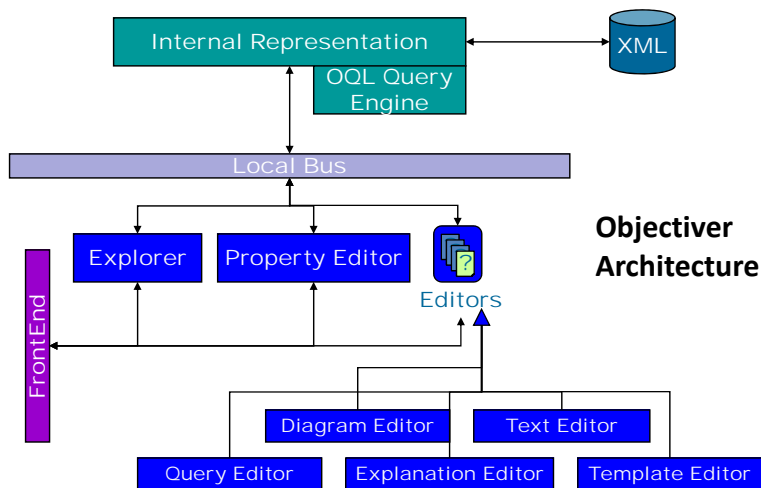
- 2 user levels:
 - Analyst (1)
 - Method engineer (is allowed to customise the tool) (2)
- No DB
- Requirements models saved in XML

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The technical corner (II)



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43

Industrial references

<p>► Requirements analyses & Reengineering</p> <ul style="list-style-type: none"> ▶ cable phone ▶ orders & shipping ▶ copyrights management ▶ air traffic control procedures ▶ property database ▶ optimisation of a production scheduling 	
<p>► Requirements documents</p> <ul style="list-style-type: none"> ▶ commercial management ▶ e-learning ▶ seizure of goods ▶ translation software ▶ medical summaries 	
<p>► Strategical plans & IT plans</p>	

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Tanks to the Objectiver crew



Robert

Denis

Denis

Christophe

Alain

Jean-Luc

Emmanuelle

(Cédric missing)

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