

From Requirements to Architectural Design --Using Goals and Scenarios



Lin Liu Eric Yu

University of Toronto

STRAW'01 - May 14 2001, Toronto, Canada

Sunday, May 27, 2001



Motivations

- Strengthen the connection between **requirements** and **architectural** design
- Overcome the limitations of **goals** and **scenarios** when used in isolation
- URN (*User Requirements Notation*) = GRL+UCM: a submission to ITU study group 10
- Use **GRL** and **UCM** together to :
 - visualize the refinement processes
 - elicit new requirements during design
 - explore new architecture alternatives
 - make tradeoffs among alternative architectures

Sunday, May 27, 2001



Agenda

- GRL
- UCM
- An example modelling process with GRL+UCM
- Related works

Sunday, May 27, 2001



GRL Introduction

(Goal-Oriented Requirement Language)

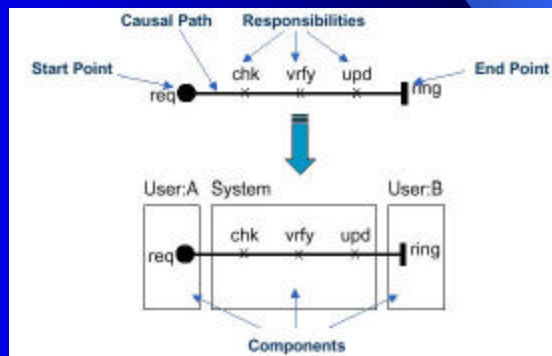
- Supports goal-orientation & agent-orientation
- Deals with non-functional requirements
- Concepts in GRL graphical notation:
 - intentional elements
 goal, task, resource, softgoal, belief
 - intentional links
 means-ends, decomposition, contribution,
 correlation , dependency
 - actors

Sunday, May 27, 2001



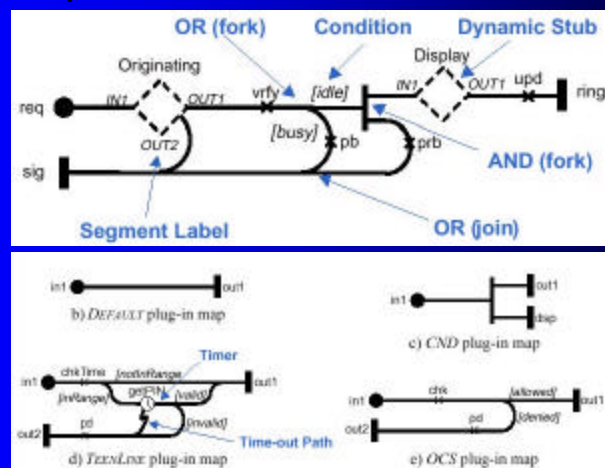
UCM Introduction (Use Case Maps)

- Scenarios describing causal relationships between responsibilities
- UCM scenarios can be allocated to abstract components
- Useful to describe features visually



Sunday, May 27, 2001

Example UCM Models



Sunday, May 27, 2001

Modelling Process of GRL+UCM

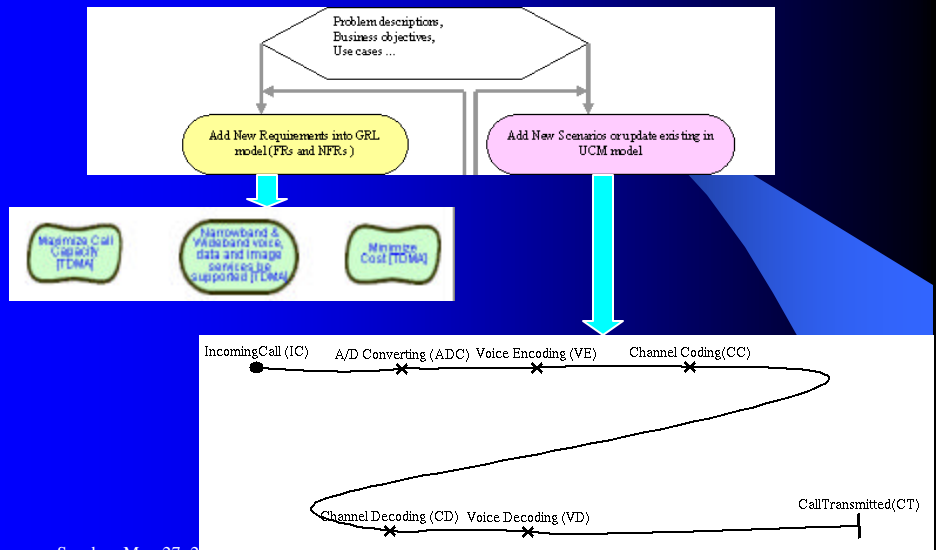
Goal Modelling

Scenario Modelling



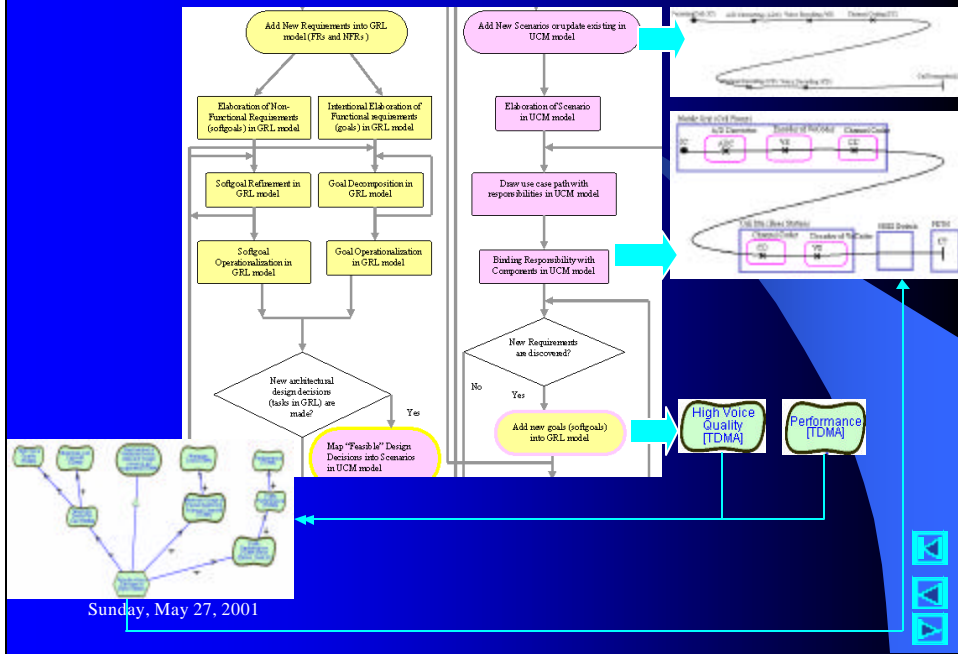
Sunday, May 27, 2001

Example Modelling Process (1)

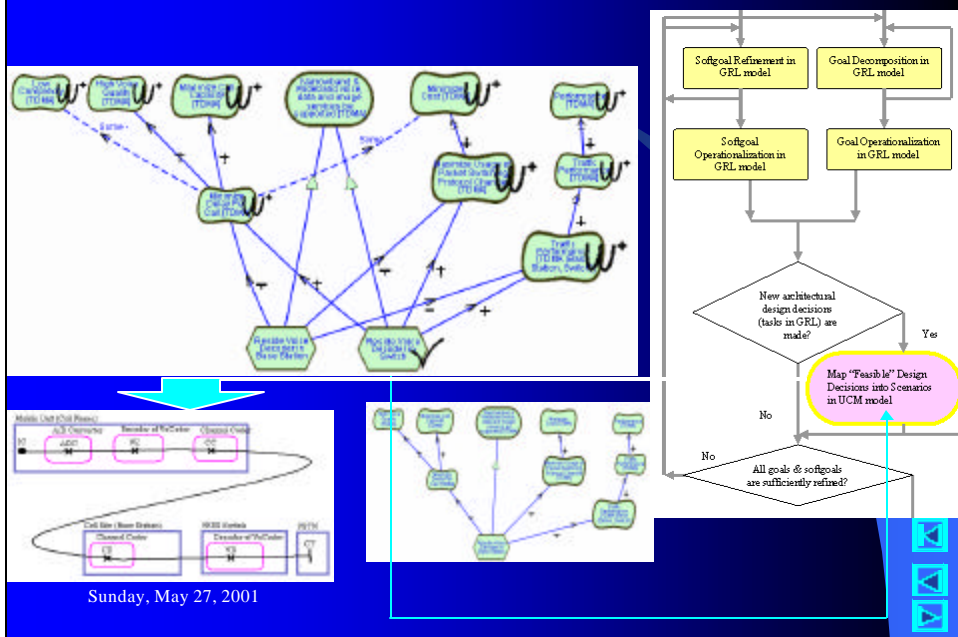


Sunday, May 27, 2001

An Example Modelling Process (2)



An Example Modelling Process (3)



Modelling Process of GRL+UCM

Goal Models



Scenario Models

Sunday, May 27, 2001

Related Works

- RE
 - Van Lamsweerde and Willemet's work on using scenarios for requirement (goal) elicitation
 - Rolland's CREWS-L'Ecritoire Approach
- Architecture
 - Kazman's Software Architecture Analysis Method
 - Krutchen's 4+1 model of software architecture

Sunday, May 27, 2001

Conclusion and Future Works

- This preliminary effort shows that:
 - Goal-orientation and Scenario-orientation complement to each other in both RE and architecture design
 - NFRs are inevitably the criteria of architectures tradeoffs
- Future directions
 - Tighter coupling of goals and scenarios in notation level
 - Better guidance and tool support on the modelling process
 - Improve the flexibility of GRL: GRL+UML, GRL+X

Sunday, May 27, 2001



More Information?

- GRL web site:
<http://www.cs.toronto.edu/km/GRL>
- UCM web site:
<http://www.usecasemaps.org>

Sunday, May 27, 2001

