LABORATOIRE D'INFORMATIQUE DE NANTES ATLANTIQUE

Topic: Behaviour Abstraction from Code

# ECONET Project

## Behaviour Abstraction from Code

## Filling the Gap between Component Specification and Implementation

supported by Egide

COLOSS - DSRG - LCI - OBASCO

Nantes - may, 12-16 2008


http://www.egide.asso.fr/fr/programmes/econet/

# Welcome

## Welcome to Nantes!
bienvenue à Nantes.

LINA's Welcome by Christian Attiogbé

Few introductory words on

- Econet Project
- First Year Results
- Workshop
- Workshop Organization

# Econet Project 1/3

- Title: Behaviour Abstraction from Code
- Subtitle: Filling the Gap between Component Specification and Implementation
- Goal:

  *The goal of this project is to contribute to the reverse engineering way by developing techniques for extraction of abstractions from code (including some component interface description) and for verification of the abstractions against the code, e.g. to check an in-line bank service with no available code, to check that a client component is compatible with an implemented component.*
- Means:

  *4-parts Cooperation*

  *The four involved teams have complementary knowledge and background on the project domain. The goal is therefore to compare and exchange the point of view, and to integrate the new ideas and techniques in the current proposal.*
- ...

# Econet Project 2/3

- Participants
  - **COLOSS**: COmposants et LOgiciels SûrS
    Safe Component and Software $\rightsquigarrow$ Component System Verification
    `http://www.lina.sciences.univ-nantes.fr/coloss/`
  - **DSRG**: Distributed Systems Research Group
    SOFA model $\rightsquigarrow$ previous work = basis for the project
    `http://dsrg.mff.cuni.cz/`
  - **LCI**: Laboratorul de Cercetare in Informatica
    Computer Science Research Laboratory $\rightsquigarrow$ OCL, MDD, Tools
    `http://lci.cs.ubbcluj.ro/`
  - **OBASCO**: OBjects, ASpects and COmponents
    Previous work on Java and Components
    `http://www.emn.fr/x-info/obasco/`
- Wiki
  `http://www.lina.sciences.univ-nantes.fr/coloss/wiki/doku.php?id=econet:start`

# Econet Project 3/3

- Project Plan

  *First year:*

  - Determination the field of application (boundaries of Java concepts and idioms).
  - Settings of the major principles to abstract behaviours for software components (into Kmelia, SOFA and STS) from Java code.
  - Experimentations on existing code.
  - Studying and proposing a pattern for annotating EJB components in order to better support RE (behavior abstraction from code).
  - Integration of the verification of guards using OCL (and OCLE).
  - Documentation, research report and workshop preparation.

  *Second year:*

  - Refinement and classification of the principle and techniques.
  - Study of the verification of assertions with OCL.
  - Reverse engineering from EJB code to EJB specification (JML or OCL).
  - Experimentation with larger case studies.
  - Documentation, research report and workshop preparation.

# First Year Summary 1/2

Events

- March: starting the project
- September: workshop at Prague (initially planned for june)
- October: workshop report, project evaluation
- November: First Common Component Metamodel published

Results

- Workshop Report
- Project Continuation
- First Draft Common Component Meta-Model

# First Year Summary 2/2

Quick Analysis

+ Workshop organisation and result
+ Complementary background of the teams
+ Methods and collaborative tools (Wiki, SVN, email)

- Time Allocation (late start, deadlines, asynchronous working period and exchanges)
- Too few (despite fruitful) technical echanges (bibliography, metamodel, tools)
- Some Misunderstandings (due to informal definitions or varying contexts?)

# First Year Results

Advance in

- Clear project definition (workshop results)
  - Convergence on the objectives
  - Convergence on the means
  - Definition of the tasks
- Project Collaborative tools (Wiki, SVN)
- Toward a common component meta-model

Standby/delay for

- Collaborative field exploration: Annoted bibliography and Synthesis (components, RE, code engineering, tools)
- A validation of the common component meta-model
- Delayed or lost activities
  - Studying and proposing a pattern for annotating EJB components in order to better support RE (behavior abstraction from code).
  - Integration of the verification of guards using OCL (and OCLE).

# First Year Workshop Results 1/3

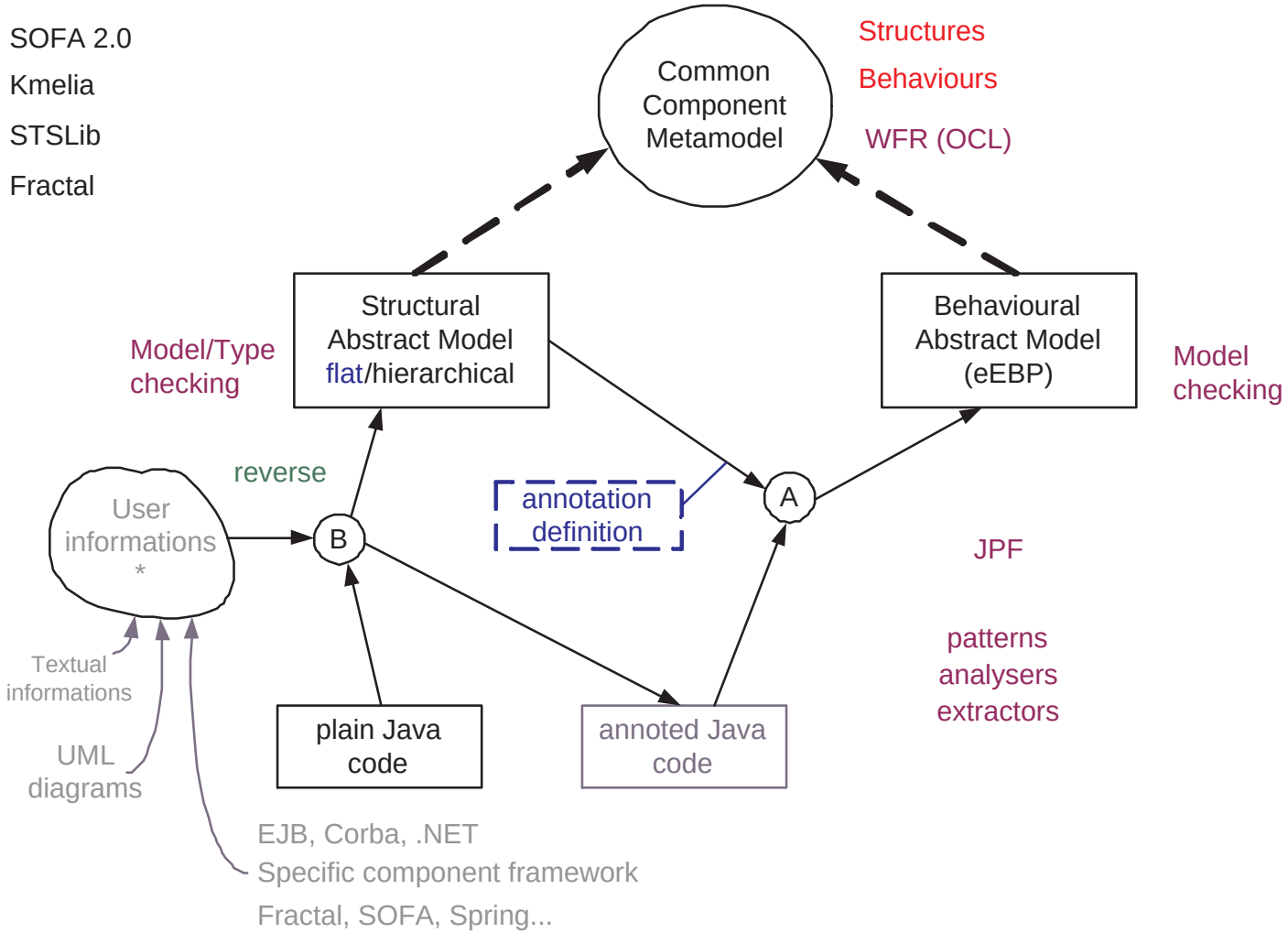
*Convergence on the objectives (summary)*

- Clear agreement on the "abstract" context
  Abstract component models
  + Java Code
  + Reverse = from code to abstract models
- Some vision of the "concrete" context
  - Java code nature
    Bytecode or Plain source or Annoted Source
  - Java code structure
    plain Java + informations
  - reengineering issues
    abstraction rather than full reverse engineering
    compare code and specifications (conformance)
- Benchmark = CoCoME
- Two other tracks: cross LTS extensions, WFR definitions

# First Year Workshop Results 2/3

*Convergence on the means (summary)*

- Project Architecture



# First Year Workshop Results 2/3

*Convergence on the means (summary)*

- Project Architecture Three parts
  1. Component Metamodel cross LTS extensions, WFR
  2. Structure Abstraction user interacted tool
  3. Behavior Abstraction A-interface definition, annotations generation
- Problem Domain Restriction
  - metamodel $\Longrightarrow$ components and behaviours
  - A $\Longrightarrow$ no connections, no composition, no statement abstraction
  - B $\Longrightarrow$ no composition, no statement abstraction, user-interactions
- Benchmark = CoCoME

# First Year Workshop Results 3/3

*Definition of the tasks (summary)*

- Prototype on the project architecture
  - Metamodel
  - Process A
  - Process B
- Cross Contributions a subset of
  - Common Metamodel Definition
  - Annotation language definition (input of process A)
  - Tools Prototypes for Metamodel verification, Process A, Process B
- Synchronisation points =
  A-interface, Metamodel def, B-Information def
- Planning deadlines
  - Workshop Nantes (begin of March 2008)
  - Workshop Cluj (end of august 2008)
- Publications

# Workshop 2008

Contents

- Participants
- Objectives and Delivery
- Program and Schedule

# Workshop 2008 (participants)

Workshop Participants $\rightsquigarrow$ *self presentations*

- Christian ATTIOGBE - COLOSS
- Dan CHIOREAN - LCI
- Dragos PETRASCU - LCI
- Frantisek Plasil - DSRG
- Gilles ARDOUREL - COLOSS
- Jacques NOYE - OBASCO
- Jean-Claude ROYER - OBASCO
- Mohammed MESSABIHI - COLOSS
- Ondrej Sery - DSRG
- Pascal ANDRE - COLOSS
- Petr HNETYNKA - DSRG
- Tomas Poch - DSRG
- Vladiela PETRASCU - LCI

# Workshop 2008 (objectives)

Workshop Objectives and Delivery (open issue !)

- Objectives $\rightsquigarrow$ Detail Design of the Project Architecture + Technical Issues
  - Metamodel: contents and design
    *concepts, relations, mains issues, approaches, plateforms and tools*
  - Processes: interfaces and design
    *structure, libraries, techniques, tools*
  - Integration and examples
    *CoCoME*
- Delivery $\rightsquigarrow$ workshop report + roadmap until next workshop
  - Prototype
  - Refine with concrete models
  - Documentation, research report and workshop preparation.
  - Perspectives and Publication

# Workshop 2008 (program)

Workshop Program and Schedule

- Day 1 and 2 are dedicated to workshop presentations. The durations and schedules leave time for numerous discussions...
  - Subproject assessment (design, realisations, tools, difficulties...)
  - Technical presentations for related subjects
- Day 3 is dedicated to workshop discussions and social events.
- Day 4 and 5 are dedicated to the project work and coordination issues.
  - Discuss and solve technical problems
  - Share the experiences,
  - Interfaces for design interacting processes, tools,
  - More on the practical organisation and responsabilities

# Workshop 2008 (schedule)

Workshop Schedule Overview (initial version)

1. Assessment
   - Monday $\Longrightarrow$ Metamodels (LCI)
   - Tuesday $\Longrightarrow$ Behaviour Abstraction (DSRG) + Structural Abstraction (COLOSS + OBASCO)
2. Organisation
   - Wednesday $\Longrightarrow$ Cluj'Workshop, Social Event
   - Friday $\Longrightarrow$ Coordination, Planning, Roadmap
3. Contribution
   - Wednesday $\Longrightarrow$ CCMM validation
   - Thursday $\Longrightarrow$ Experimentation assessment, technical discussions
   - Friday $\Longrightarrow$ Task, Responsabilities, Perspectives

More details on the Workshop Wiki

http://www.lina.sciences.univ-nantes.fr/coloss/wiki/doku.php?id=econet:nantes2008:program08n

# Workshop Organisation

## Welcome to Nantes!
Bienvenue à Nantes.

Welcome package

- LINA presentation
- Tourism and city information

Few words on the organisation

- Rooms and Wifi: Pascal
- Accomodation: Christian
- Social event: Gilles