



TECHNISCHE  
UNIVERSITÄT  
DRESDEN



Fakultät Informatik

# OCCL Tools Report based on the IDE4OCCL Feature Model

Joanna Chimiak-Opoka, Birgit Demuth, Andreas  
Awenius, Dan Chiorean, Sébastien Gabel, Lars  
Hamann, Edward Willink

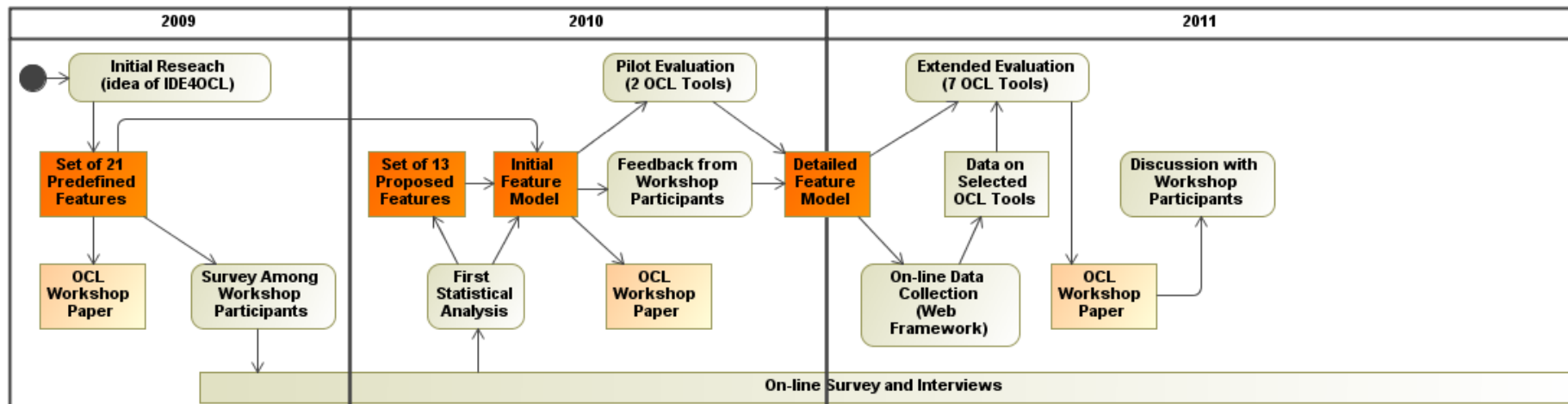
---

## The Vision of an IDE4OCL (Integrated Development Environment for OCL)

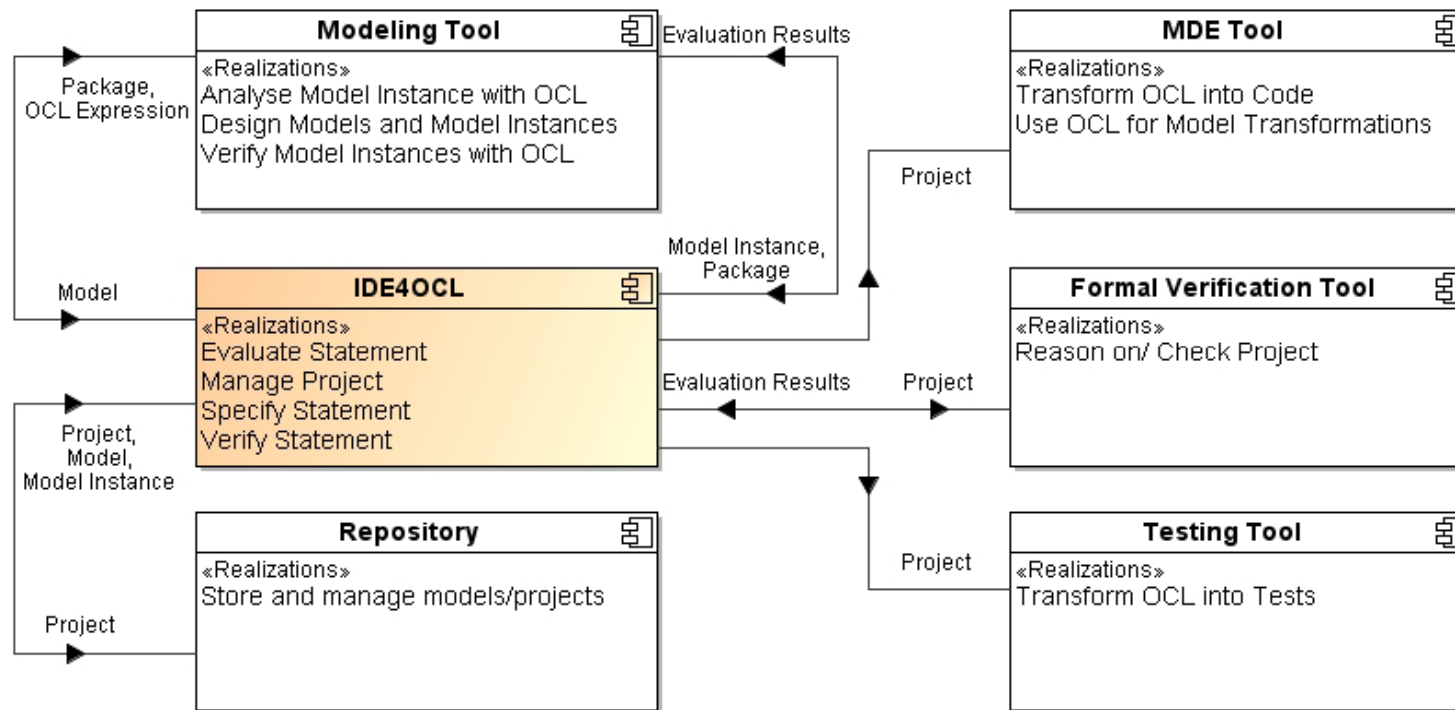
Vision without action is a daydream.  
Action without vision is a nightmare.

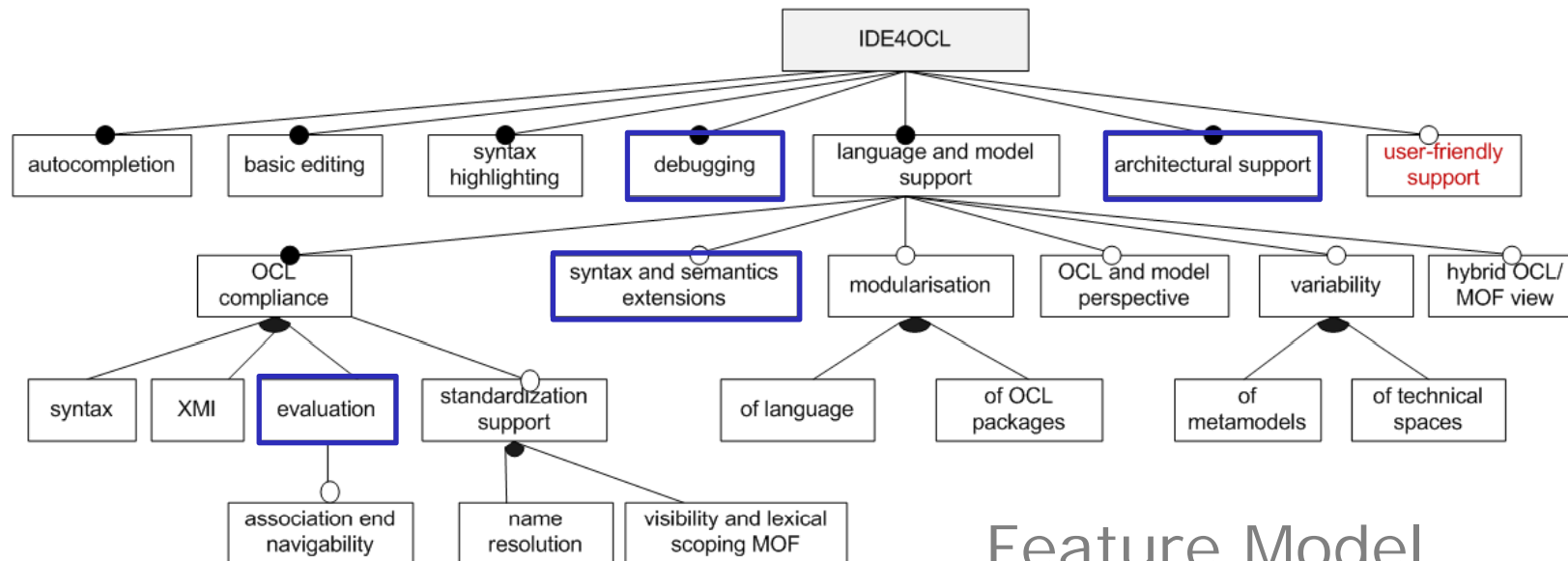
*Japanese proverb*

# IDE4OCL Research

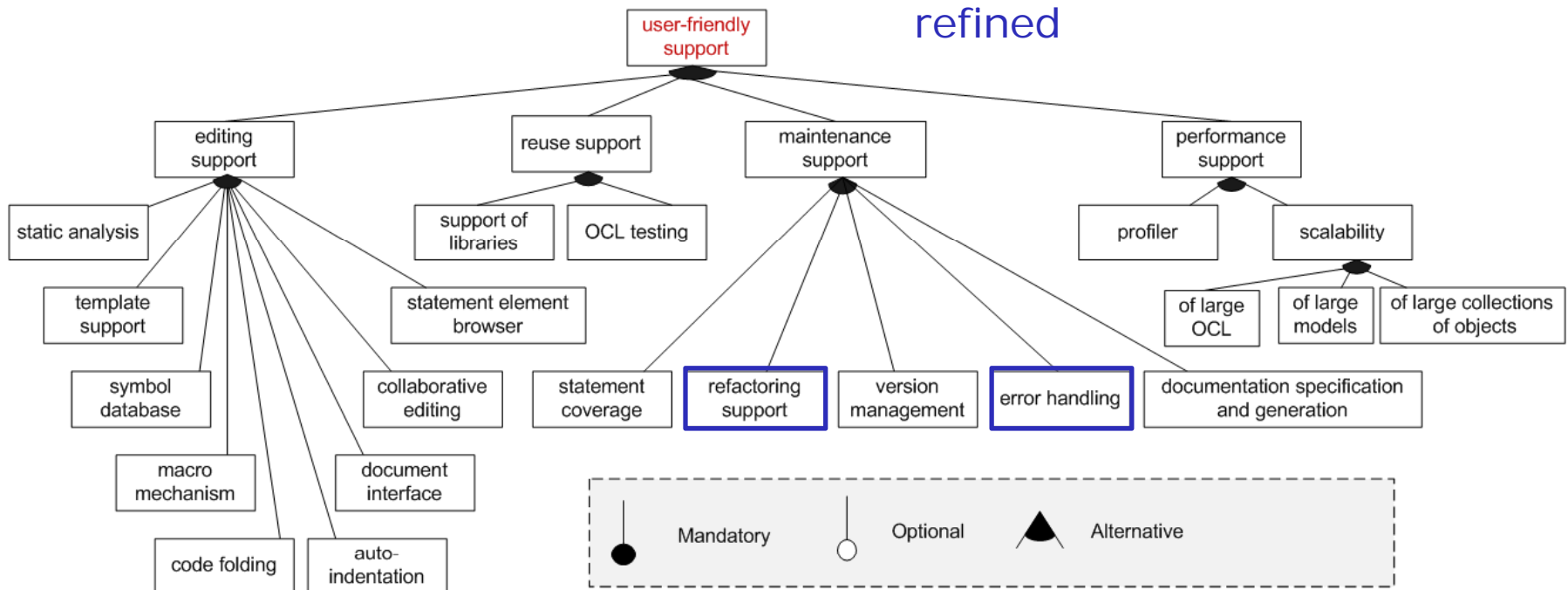


## The OCL Tool Landscape





## Feature Model refined



---

---

## Selected OCL Tools

- Dresden OCL
- Eclipse OCL
- Oclarity
- OCLE
- SQUAM OCL
- TOPCASED VF
- USE

## Feature Evaluation

- implemented
- third-party tool
- under development
- planned
- not supported



## Comparison of OCL tools based on the IDE4OCL feature model

Registered users may login to provide data about tools

[Log out Birgit.Demuth](#)

About	Features	OCL Tools	Feature Model	Statistics	Overview Table
<p><b>Dresden OCL</b> (version: 3.1.0 from 2011-01-17)</p> <hr/> <p><b>Feature Model</b> feature model last updated on</p> <ul style="list-style-type: none"> <li>2011-04-04T08:03:54</li> </ul> <p>information provided by</p> <ul style="list-style-type: none"> <li><a href="#">Birgit Demuth</a></li> <li><a href="#">Claas Wilke</a></li> </ul> <hr/> <p><b>Description</b></p> <p>owner : Technische Universitaet Dresden, Germany</p> <p>licence : LGPL</p> <p>homepage : <a href="http://www.dresden-ocl.org/">http://www.dresden-ocl.org/</a></p> <p>standard : OCL 2.2 / OCL 2.3</p> <hr/> <p>Dresden OCL's first version was released in 1999 as Dresden OCL Toolkit. Dresden OCL is designed for openness and modularity. It is made available as open source. Our</p>					
<p> <input type="checkbox"/> not supported Support of Libraries  <input type="checkbox"/> Editing Support                 </p> <ul style="list-style-type: none"> <li><input type="checkbox"/> implemented Auto-indentation</li> <li><input type="checkbox"/> not supported Collaborative Editing</li> <li><input type="checkbox"/> implemented Code Folding</li> <li><input type="checkbox"/> implemented Document Interface</li> <li><input type="checkbox"/> not supported Macro Mechanism</li> <li><input type="checkbox"/> implemented Statement Element Browser</li> <li><input type="checkbox"/> implemented Static Statement/Specification Analysis</li> <li><input type="checkbox"/> implemented Symbol Database</li> <li><input type="checkbox"/> not supported Template Support</li> </ul> <p> <input type="checkbox"/> Maintenance Support                 </p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Refactoring Support                         <ul style="list-style-type: none"> <li><input type="checkbox"/> under development Renaming</li> <li><input type="checkbox"/> under development Extracting</li> <li><input type="checkbox"/> under development Removing</li> </ul> </li> </ul>					
<p><b>Auto-indentation</b> <i>User Friendly Support::Editing Supp</i></p> <p><b>Type</b> ^ predefined, alternative feature</p> <p><b>Description</b> helps to better convey the structure case of OCL, indentation can be used for nested structures.</p> <hr/> <p><b>State in Dresden OCL</b> implemented</p> <p><b>Details for Dresden OCL</b></p>					



Comparison of OCL tools based on the IDE4OCL feature model

Log in

		Feature Qualified Name	Feature Name	Dresden OCL	Eclipse OCL	Oclarity	OCLE	SQUAM OCL	TOPCASED VF	USE
<input type="checkbox"/>	Language and Model Support::OCL Compliance::Evaluation Compliance::4-Valued Logic		4-Valued Logic	implemented	implemented	not supported	implemented	third-party tool	not supported	not supported
<input type="checkbox"/>	Language and Model Support::OCL Compliance::Evaluation Compliance::Access Private and Protected Features of an Object		Accessing Private and Protected Features of an Object	implemented	implemented ...	not supported	implemented	third-party tool	not supported	implemented
<input type="checkbox"/>	Language and Model Support::OCL Compliance::Evaluation Compliance::allInstances		allInstances()	implemented	implemented ...	not supported	implemented	third-party tool	implemented	implemented
<input type="checkbox"/>	Language and Model Support::OCL Compliance::Evaluation Compliance::Association End Navigability		Association End Navigability	not supported	implemented ...	not supported	implemented	third-party tool	not supported	implemented
<input type="checkbox"/>	User Friendly Support::Editing Support::Auto-indentation		Auto_indentation	implemented	implemented ...	not supported	implemented	implemented ...	not supported	third-party tool
<input type="checkbox"/>			Autocompletion	implemented	implemented ...	under development	planned	implemented ...	implemented	not supported
<input type="checkbox"/>	Debugging::Automated Test Cases		Automating Test Cases	planned	not supported	not supported	planned	not supported	not supported	implemented
<input type="checkbox"/>			Basic Editing	implemented	implemented ...	implemented	implemented	implemented ...	implemented	third-party tool
<input type="checkbox"/>	Architectural									

**Tool Comparison**  
In the comparison table only atomic features are presented, when they are provided for at least one tool. You can:

- **sort** data in columns,
- **select** columns / rows and **move** them,
- **remove features** you are not interested in by selecting rows and removing them from the *selection popup menu*,
- **reload** the table or (de)select all rows from the *header popup menu*,
- click on a cell to display **details**.



## OCL Tool Landscape Coverage

OCL Tool	Core	Additional Components				
Dresden OCL	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool
Eclipse OCL	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool
Oclarity	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool
OCLE	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool
SQUAM	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool
TOPCASED-VF	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool
USE	IDE4OCL	Modeling Tool	Repository	MDE Tool	FV Tool	Testing Tool

## Native IDE4OCL Components

reuses

	Dresden OCL	Eclipse OCL	Oclarity	OCLE	SQUAM OCL	TOPCASED-VF	USE
OCL Parser	+	+	+	+	Eclipse OCL	Eclipse OCL	+
OCL Evaluator	+	+		+	+	+	+
OCL Editor	+	+	+	+	+	+	
Impact Analyser		+					
OCL Libraries					+		
OCL Doc					+		
OCL Extensions					+		+
OCL Checker						+	
OCL Reporting						+	

## Summary

- Refined feature model
- Feature model in a web framework online
  - <http://ide4ocl.opoki.com/featuremodel/>
- 7 publicly documented OCL tools in this framework
  - First comparative and quantitative evaluation of these tools
  - Qualitative comparison could not be achieved
- Top-level architecture of the OCL tools in terms of the OCL tools landscape

## Outlook

- Qualitative evaluation of OCL tools
- Discussion of the feature evaluation values such as extending by **partially implemented** and **fully tested**
- Involve further OCL tools
- Develop feature model as **reference model** for OCL tools?
- Discuss cooperation in further development of OCL tool support

---

Thank You for Coming and Keeping Together!

Coming together is a beginning.  
Keeping together is progress.  
Working together is success.



*Henry Ford (1863 – 1947)*



TECHNISCHE  
UNIVERSITÄT  
DRESDEN



OE  
QUALITY ENGINEERING

---

## Backup Slides

## Further OCL Tools to Involve?

- EOS (Manuel Clavel et al.)
  - ECO/Gaffr for Visual Studio (Jonas Hogstrom, Hans Karlsen@CapableObjects)
  - Kent OCL Library (Dave Akehurst et al.)
  - MIP OCL2 Parser (Steve Wartik) supporting Enterprise Architect
  - OSLO (Christian Hein@Fraunhofer Berlin) – Open Source Library for OCL
  - ... ?
- 
- HOL-OCL (Achim Brucker, Burkhard Wolff)
  - KeY Tool (Reiner Hähnle)
  - UMLtoCSP (Jordi Cabot)
  - ... ?

# OCCL Portal

st.inf.tu-dresden.de/occlportal/

## List of modeling tools with OCL support

Sunday, 25 July 2010 13:32

Birgit Demuth



Here you find a list of UML and MDE tools in alphabetic order that provide OCL support by different manner and power (parsing, static checking, evaluation, code generation, ... ). Note that many UML tools provide only an OCL constraint specification feature. But OCL expressions should be at least able to be parsed. Otherwise this tool is not worth to be called as a "tool with OCL support".

An overview about UML tools can be found at [umltools.freebase.com](http://umltools.freebase.com)

Please let me know if you know further modeling tools with OCL and/or write own OCL Portal entries with more detailed information about OCL tools.

- Arcstyler by [Interactive Objects](#)
- [ArgoUML \(Open Source\)](#)
- [Borland Together](#)
- [Eclipse Model Development Tools \(MDT\)](#)
- [ECO for Visual Studio by CapableObjects](#)
- [Enterprise Architect by Sparx Systems](#)
- [Fujaba \(Open Source\)](#)
- Innovator by [MID](#)
- [Magic Draw UML by NoMagic](#)
- [Oclarity for Rational Rose](#)
- [Papyrus UML \(Open Source\)](#)
- [TOPCASED \(Open Source\)](#)



## Debugging Features

- Tracing
- Variable Watching
- Breakpoints
- Step by Step Execution
- Value Insertion
- Automating Test Cases

## Evaluation Compliance Features

- Association end navigability
- 4-valued-logic (mandatory)
- Semantics as defined in the specification (mandatory)
- allInstances()
- Pre-values and oclIsNew() in postconditions
- OclMessages
- Accessing private and protected features of an object

## Syntax and Semantics Extension Features

- OCL embedding
- OCL extending
- Alternative concrete syntax
  - Parsing support
  - Printing support

## Refactoring support

- Renaming
- Extracting
- Removing
- Changing OCL context
- Co-refactoring and co-evolution
- Further refactorings

## Dresden OCL Refactoring Support

- Renaming
- Extract variable
- Inline Variable
- Remove unused variable
- Remove redundant brackets
- Split expressions
- Separate context classifiers
- Split expression atomic
- Merge expressions
- Merge context classifiers
- Merge atomic expressions
- Split conditional rules
- Remove/materialize self
- Remove/materialize type

---

## Error Handling Features

- Static semantics
- Dynamic semantics

## Architectural Support Features

- Batch mode
- Interfaces to other components from the OCL landscape
  - Modeling tool
  - MDE tool
    - Code generation
    - Model Transformation
  - Formal verification tool
  - Repository
    - Version management
      - File-based version management
      - Model-based version management
  - Testing tool

---

## Features in all tools

- Basic editing
- Document interface
- Syntax highlighting
- Syntax compliance

## Further most wanted features

- Auto-completion
- Debugging
- Refactoring support