ALPEN-ADRIA UNIVERSITÄT
KLAGENFURT | WIEN GRAZ

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Workshop des Arbeitskreis 4
25. November 2014

Wie kann man angesichts steigender Komplexität das Requirements Engineering nutzerorientiert und agil gestalten?

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Content:

observations

questions

claims

examples

Effective Requirements Engineering is still an open issue

Software development projects often exceed the budget or even fail …

… despite of nearly 50 years of software engineering research and practice!!

Typical Causes | 1

Mismatch between the user expectations and the actual properties of the developed product.

Mostly pertains to non-functional properties, in particular the many-facetted concept of quality.

Cause: ineffective communication

Typical Causes | 2

consciously, people don’t like to model

prefer doing to planning => “Agility”

Requirements Engineering = Modeling!!

Problem in practise:

Inappropriate Modeling Method

2HC: 'Logistic Growth' holds for Modeling Languages

(Pierre-François Verhulst 1838)

smooth beginning

increasing growth

turning point

decreasing growth

collapse

E.g. PSL/PSA (Teichroew, 1964ff)

ISDOS: Information System Design and Optimization System

initially lean and clear

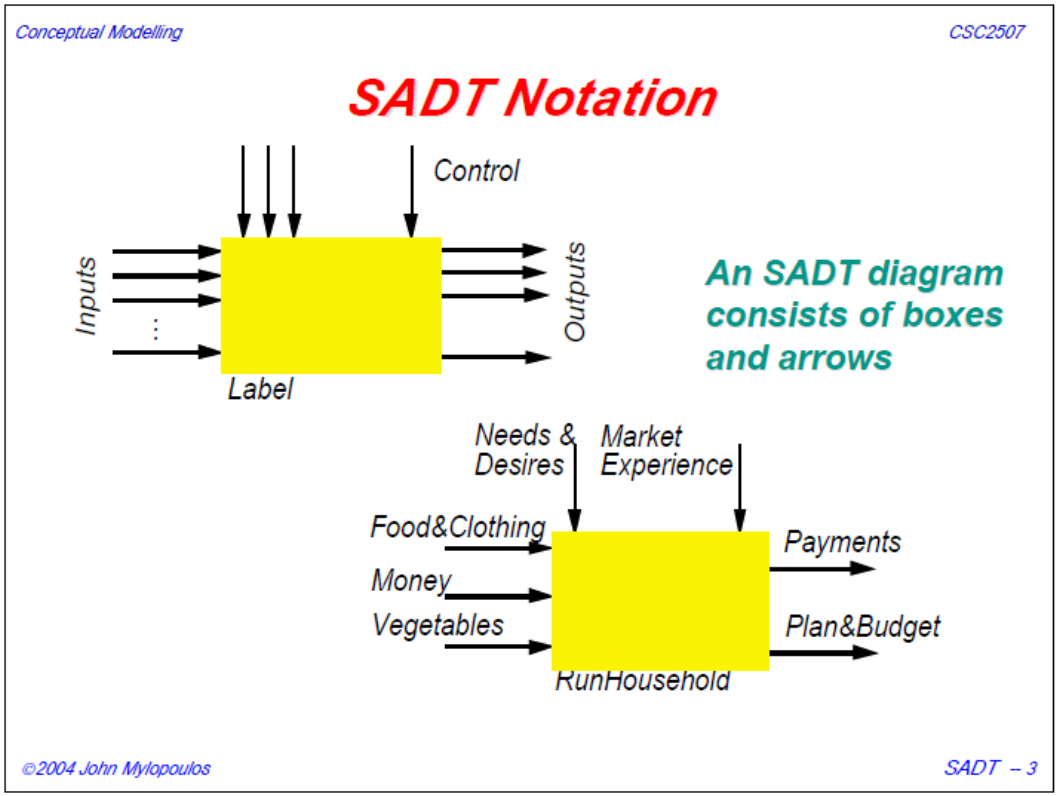
at the end:

19 „Objekts“ (ENTITY, ATTRIBUTE, CONDITION, ELEMENT, EVENT, PROCESS, REQUIREMENT etc.)

102 (!) „Relationships“

SADT (D.T.Ross, 1969-1973)

Structured Analysis & Design



E.g. SA (Tom de Marco, 1978)

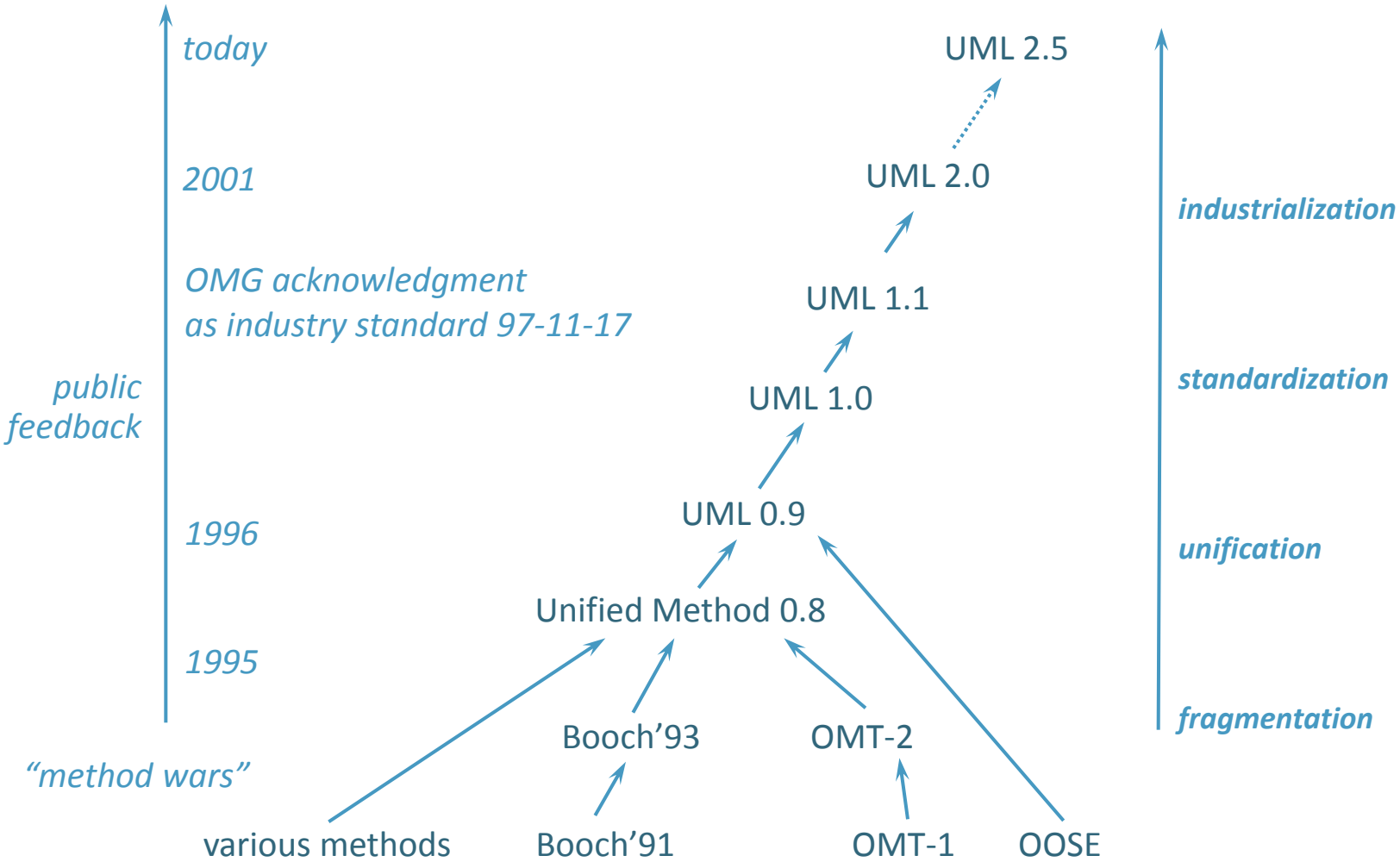
	PURPOSE	CONCEPT		MECHANISM	NOTATION	NODE
1	BOUND CONTENT	INSIDE/OUTSIDE		SA BOX	NAME	A11
2	RELATE/CONNECT	FROM/TO		SA ARROW	LABEL	A12
3	SHOW TRANSFORMATION	INPUT-OUTPUT		SA INTERFACE	INPUT OUTPUT	A13
4	SHOW CIRCUMSTANCE	CONTROL		SA INTERFACE	CONTROL	A14
5	SHOW MEANS	SUPPORT		SA MECHANISM	MECHANISM	A15
6	NAME APTLY	ACTIVITY HAPPENINGS	DATA THINGS	SA NAMES	ACTIVITY VERB / DATA NOUN	A211
7	LABEL APTLY	THINGS	HAPPENINGS	SA LABELS	NOUN / VERB	A212
8	SHOW NECESSITY	1-0	C-0	PATH		A213
9	SHOW DOMINANCE	C	I	CONSTRAINT		A214
10	SHOW RELEVANCE	ICO	ICO	ALL INTERFACES		A215
11	OMIT OBVIOUS	C-0	I-0	OMITTED ARROW		A216
12	BE EXPLICIT WITHOUT CLUTTER	PIPELINES, CONDUITS, WIRES		BRANCH	A A	A221
13				JOIN	A A	A221
14	BE CONCISE AND CLEAR	CABLES, MULTI-WIRES		BUNDLE	A B C=(A,B)	A222
15				SPREAD	C=(A,B) A B	A222
16	SHOW EXCLUSIVES	EXPLICIT ALTERNATIVES		OR BRANCH	A OR B A B	A223
17				OR JOIN	A B A OR B	A223
18	SHOW INTERFACES TO PARENT DIAGRAM	ARROWS PENETRATE		SA BOUNDARY ARROWS (ON CHILD)	PARENT CHILD NO BOX SHOWN	A231
19	SHOW EXPLICIT PARENT CONNECTION	NUMBER CONVENTION FOR PARENT, WRITE ICOM CODE ON CHILD BOUNDARY ARROWS			C1 C2 (ON CHILD) O2	A232
20	SHOW UNIQUE DECOMPOSITION	DETAIL REFERENCE EXPRESSION (DRE)		C-NUMBER OR PAGE NUMBER OF DETAIL DIAGRAM	BOX DRE	A233
21	SHOW SHARED OR VARIABLE DECOMPOSITION	DRE WITH (MODEL NAME)		SA CALL ON SUPPORT	BOX STUB DRE	A234

	PURPOSE	CONCEPT	MECHANISM	NOTATION	NODE
22	SHOW COOPERATION	INTERCHANGE OF SHARED RESPONSIBILITY	SA 2-WAY ARROWS		A311
23	SUPPRESS INTERCHANGE DETAILS	ALLOW 2-WAY WITHIN 1-WAY PIPELINES	2-WAY TO 1-WAY BUTTING ARROWS		A312
24	SUPPRESS "PASS-THROUGH" CLUTTER	ALLOW ARROWS TO GO OUTSIDE DIAGRAMS	SA "TUNNELING" (WITH REFERENCES)	PARENT OFFSPRING	A313
25	SUPPRESS NEEDED-ARROW CLUTTER	ALLOW TAGGED JUMPS WITHIN DIAGRAM	TO ALL OF FROM ALL	TO ALL	A314
26	SHOW NEEDED ANNOTATION	ALLOW WORDS IN DIAGRAM	SA NOTE	NOTE:	A32
27	OVERCOME CRAMPED SPACE	ALLOW REMOTE LOCATION OF WORDS IN DIAGRAM	SA FOOTNOTE		A32
28	SHOW COMMENTS ABOUT DIAGRAM	ALLOW WORDS ON (NOT IN) DIAGRAM	SA META-NOTE		A32
29	ENSURE PROPER ASSOCIATION OF WORDS	TIE WORDS TO INTENDED SUBJECT	SA "SQUIGGLE"	(TOUCH REFERENT)	A32
30	UNIQUE SHEET REFERENCE	CHRONOLOGICAL CREATION	SA C-NUMBER	AUTHOR INITI INTEGER	A41
31	UNIQUE BOX REFERENCE	PATH DOWN TREE FROM BOX NUMBERS	SA NODE NUMBER (BOX NUMBERS)	P, D, OR M PARENT P, BOX #	A42
32	SAME FOR MULTI-MODELS	PRECEDE BY MODEL NAME	SA MODEL NAME	MODEL NAME/NODE#	A42
33	UNIQUE INTERFACE REFERENCE	ICOM WITH BOX NUMBER	SA BOX ICOM	BOX# · ICOM CODE	A43
34	UNIQUE ARROW REFERENCE	FROM - TO	PAIR OF BOX ICOMs	BOX ICOM1 BOX ICOM2	A44
35	SHOW CONTENT REFERENCE	SPECIFY A REFERENCE POINT	SA REF.EXP. "DOT"	A122.N11 "WHICH SLE"	A45
36	ASSIST CORRECT INTERPRETATION	SHOW DOMINANCE GEOMETRICALLY (ASSIST PARSE)	STAIRCASE LAYOUT	DOMINANCE	A5
37	ASSIST UNDERSTANDING	PROSE SUMMARY OF MESSAGE	SA TEXT	NODE# · T · INTEGER	A5
38	HIGHLIGHT FEATURES	SPECIAL EFFECTS FOR EXPOSITION ONLY	SA FEOs	NODE# : F · INTEGER	A5
39	DEFINE TERMS	GLOSSARY WITH WORDS & PICTURES	SA GLOSSARY	MODEL NAME · G : INTEGER	A5
40	ORGANIZE PAGES	PROVIDE TABLE OF CONTENTS	SA NODE INDEX	NODE# ORDER	A5

Fig. 2. SA language features.

Tool: IDEFx still used?

UML


today
2001
OMG acknowledgment
as industry standard 97-11-17
public
feedback
1996
1995
"method wars"
UML 2.5
UML 2.0
UML 1.1
UML 1.0
UML 0.9
Unified Method 0.8
Booch'93
OMT-2
various methods
Booch'91
OMT-1
OOSE
industrialization
standardization
unification
fragmentation

UML 0.9 (1996)

Use Case Diagram

Class Diagram

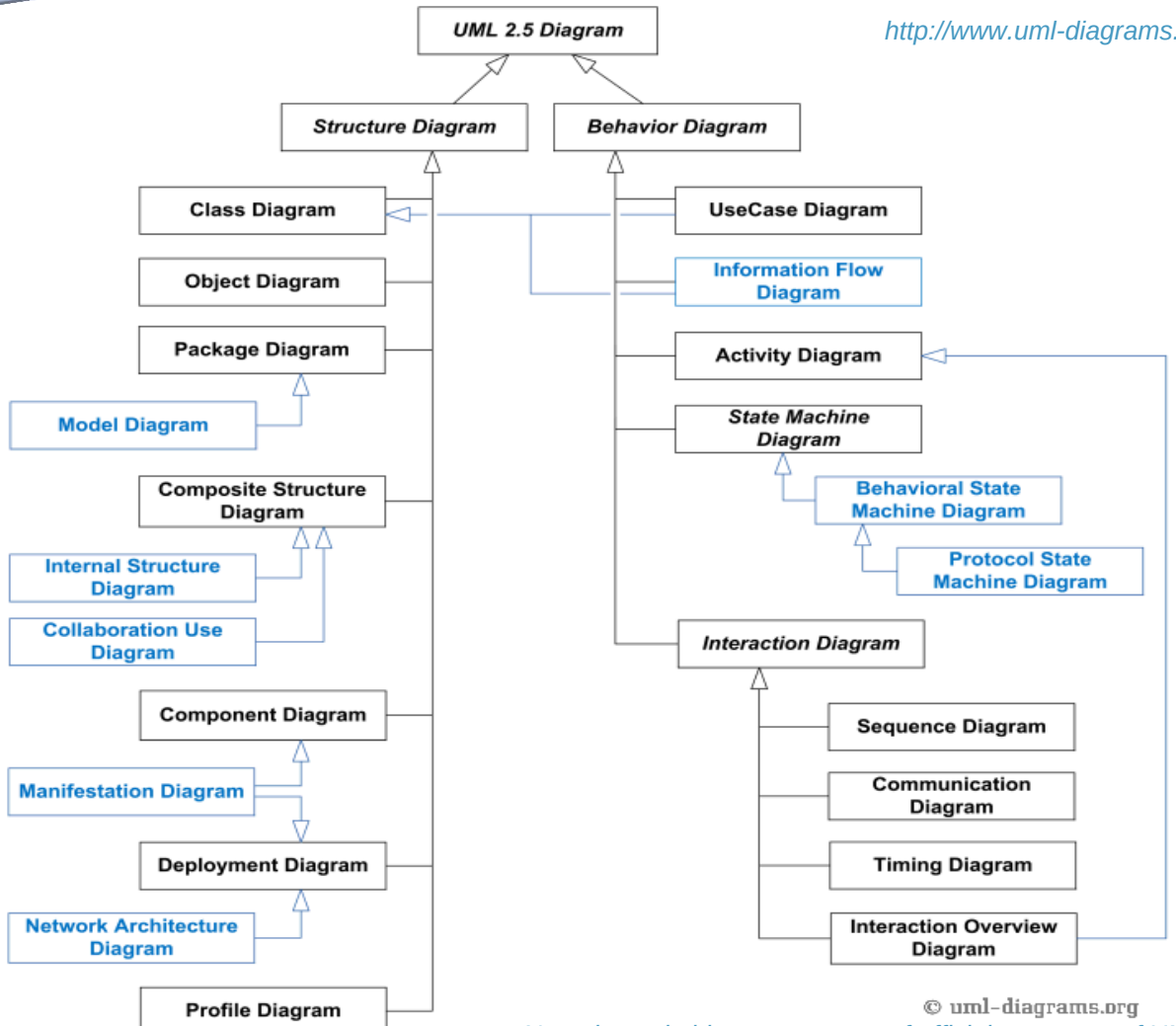
Sequence Diagram

Collaboration Diagram

State Diagram

UML 2.5 (today)

http://www.uml-diagrams.org/uml-25-diagrams.html



Note, items in blue are not part of official taxonomy of UML 2.5 diagrams

Advise

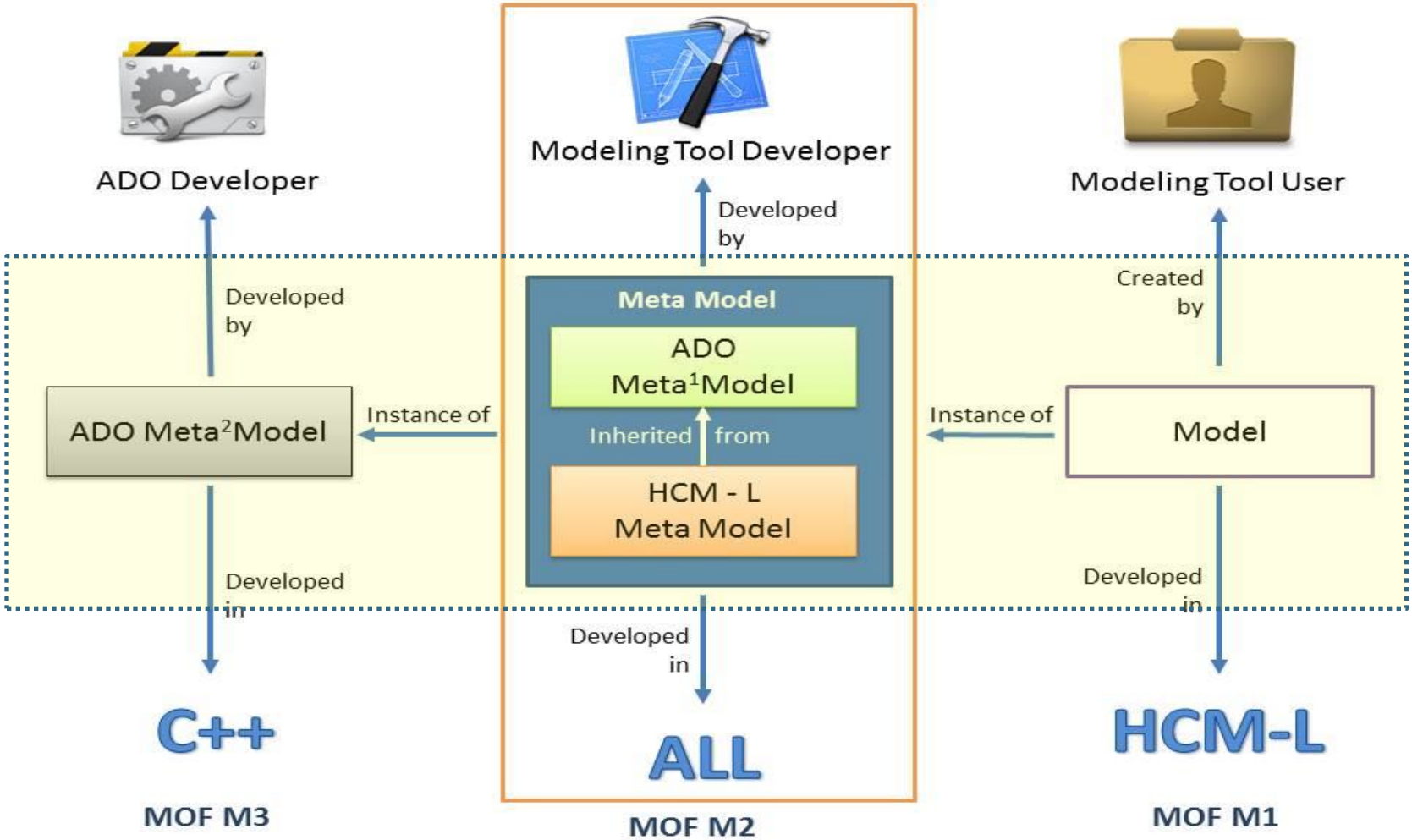
put „overloaded“ methods out of the focus

put the nature of modeling into the focus

support goal-centered (adhoc) modeling languages: DSMLs

provide automated tool generation

HCM-L Tool developed using the meta modeling platform ADOxx®



Advise

Support and manage communication between the different parties involved in a software development project over all its stages:

this will ensure a common understanding of the user expectations and the realizable/realized properties.

QuASE: Quality Aware Software Engineering

Modeling

Knowledge Base

Understandability Management

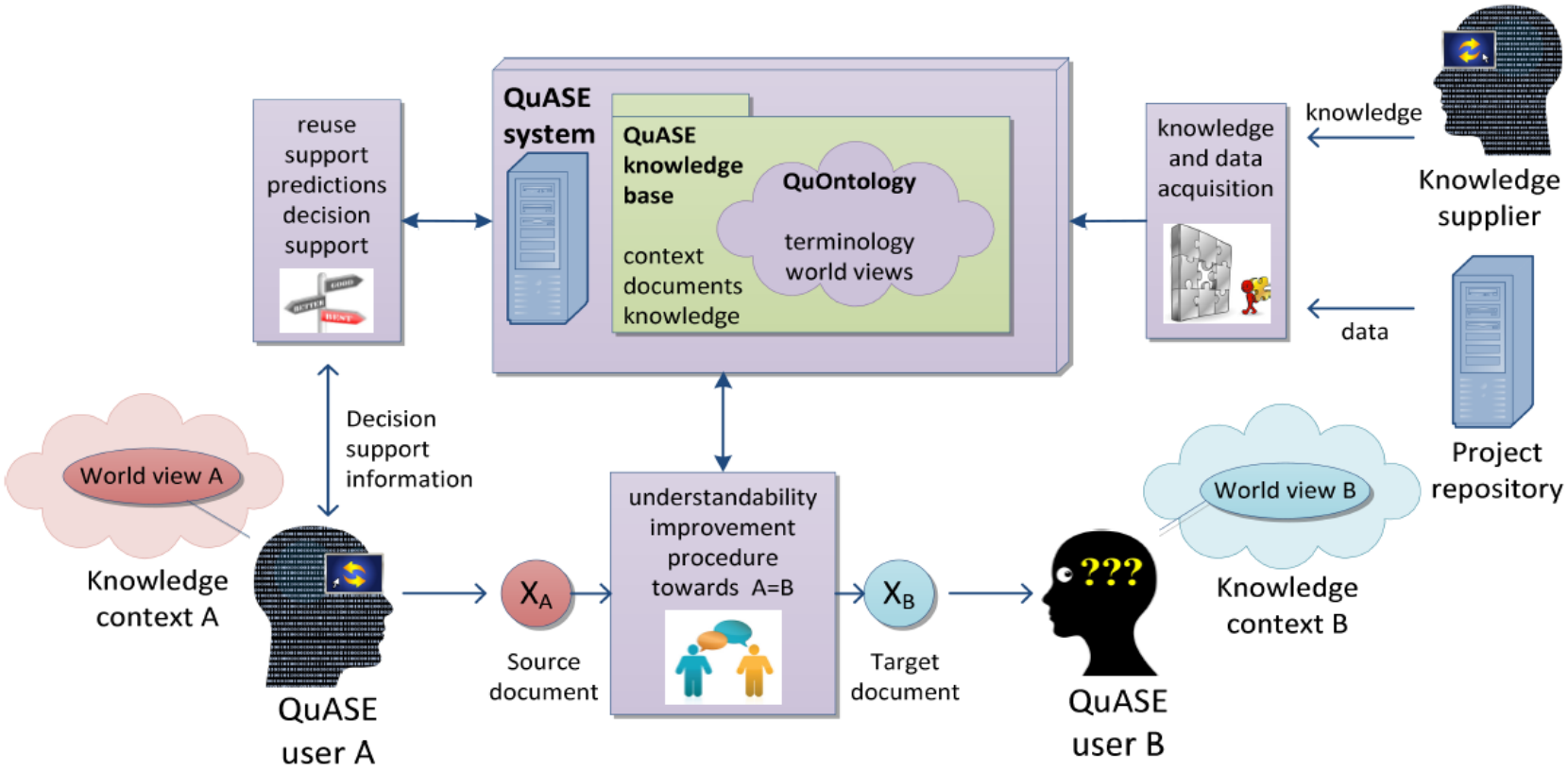
Support:

- reuse of quality-related experience
- decision making in software processes
- prediction of quality-related behavior of the involved parties

Add-on to issue management systems like JIRA, Mantis, SAP Solution Manager

QuASE: Overview

Start: 2013, Duration: 2 years, funded by FFG
2 researchers, 4 developers, 4 partner companies



LSZ CIO Kongress, November 25, 2014