Content
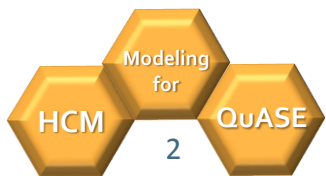
Quality – what's this?

Challenges related to Quality

QuASE: Quality Aware Software Engineering

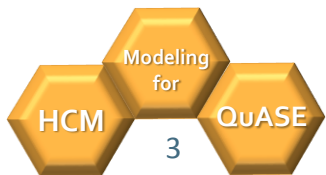Quality Modeling

References

Modeling for HCM QuASE

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Quality

Definitions

- Cadle/Yates (2008):
  „*The degree of excellence of a thing*"
- simplest: "*The property that a product meets its specification*"
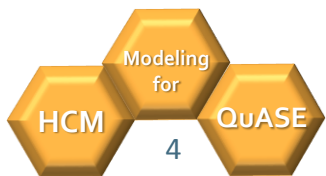- …..

Standards

Basic Challenge

Common understanding of all people involved

in eliciting and specicfying the

- functional

- non functional

requirements

Quality Dimensions

Technology
- RE / Modeling
- Tools, Platforms, Infrastructure

Process

Product

People
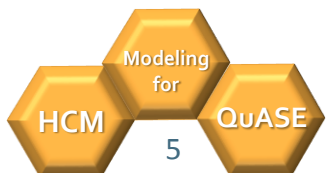
SW Quality Attributes

Safety	Understandability	Portability
Security	Testability	Usability
Reliability	Adaptability	Reusability
Resilience	Modularity	Efficiency
Robustness	Complexity	Learnability

Quality Obstacles

SW Paradigms

- The Art of Programming (D. Knuth)
- Software Engineering
- Agile Development
- Software Production
  - mostly reduced to "product lines"
  - prohibits application of TQM
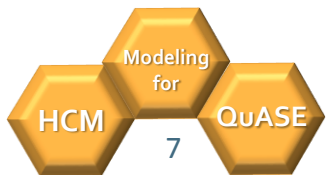
Enemies of Quality

Cost pressure

Inadequate means

Insufficient competence

Enemies of Quality

Mentality

- Maturation at client's site
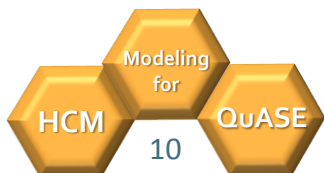- *"Academic approaches are useless"*
- *"Too bureaucratic / documentation"*
- Weak Authority: *"no problem", "at any time", "at the press of a button"*

QuASE FFG 3215531

Goals
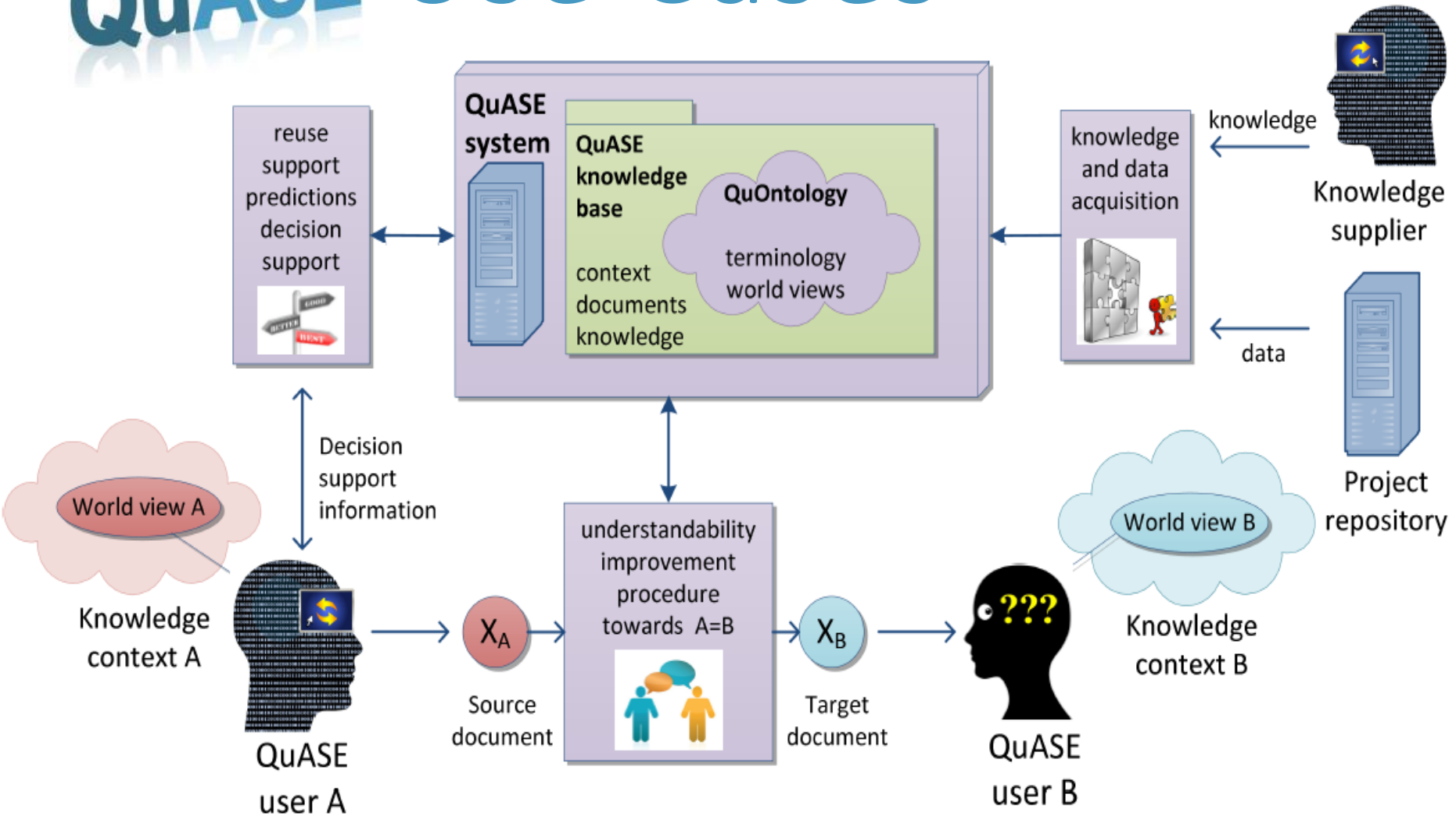
1. knowledge formalization: Concepts=>Ontology
2. knowledge acquisition: Knowledge Base
3. understandibility management: View Harmonization
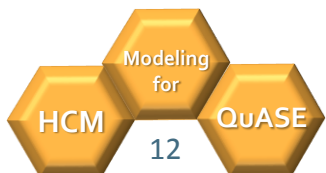4. decision support
5. tool integration
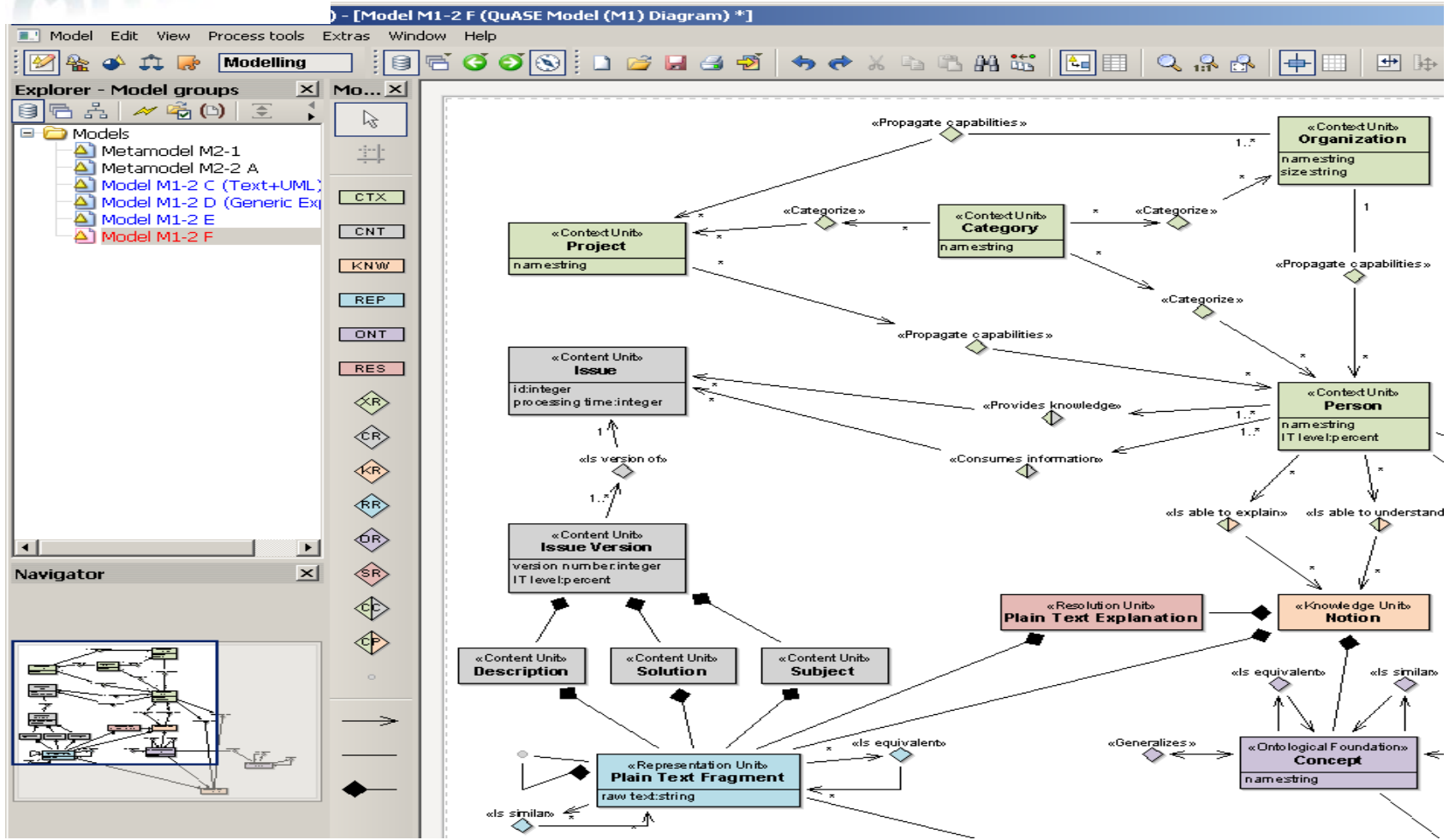
QuASE Use Cases

QuASE Model Centered

Michael Roseman today:

"shift to real-time conceptual modeling"
"from analyzing yesterday to predicting tomorrow"

Model as the real-time kernel of QuASE

Site Model

Runtime Archit.

QuASE

QuASE deployment manager

QuASE

Client host

ADOxx

QuASE DSL editor

QuASE metamodel specification

DSL for site | DSL for mapping

Project DB definition

QuASE site model (XML)

Model enhancer

Analysis concepts

Understandability metrics

QuASE ontology builder

Jira-specific configuration

QuASE repository mapping specification

QuASE site ontology

raw project data

State handler

QuASE knowledge base builder

IMS (e.g. Jira)

Project DB

IMS user

KB-ready project data

IMS QuASE integration module

QuASE deployment handler

QuASE knowledge supplier

Server host

QuASE Tool

State editor

State provider

QuASE KB

QuASE ABox

QuASE Triple store

QuASE User

End-user module

Ontology writer

QuASE TBox

SPARQL

ontological data

control requests
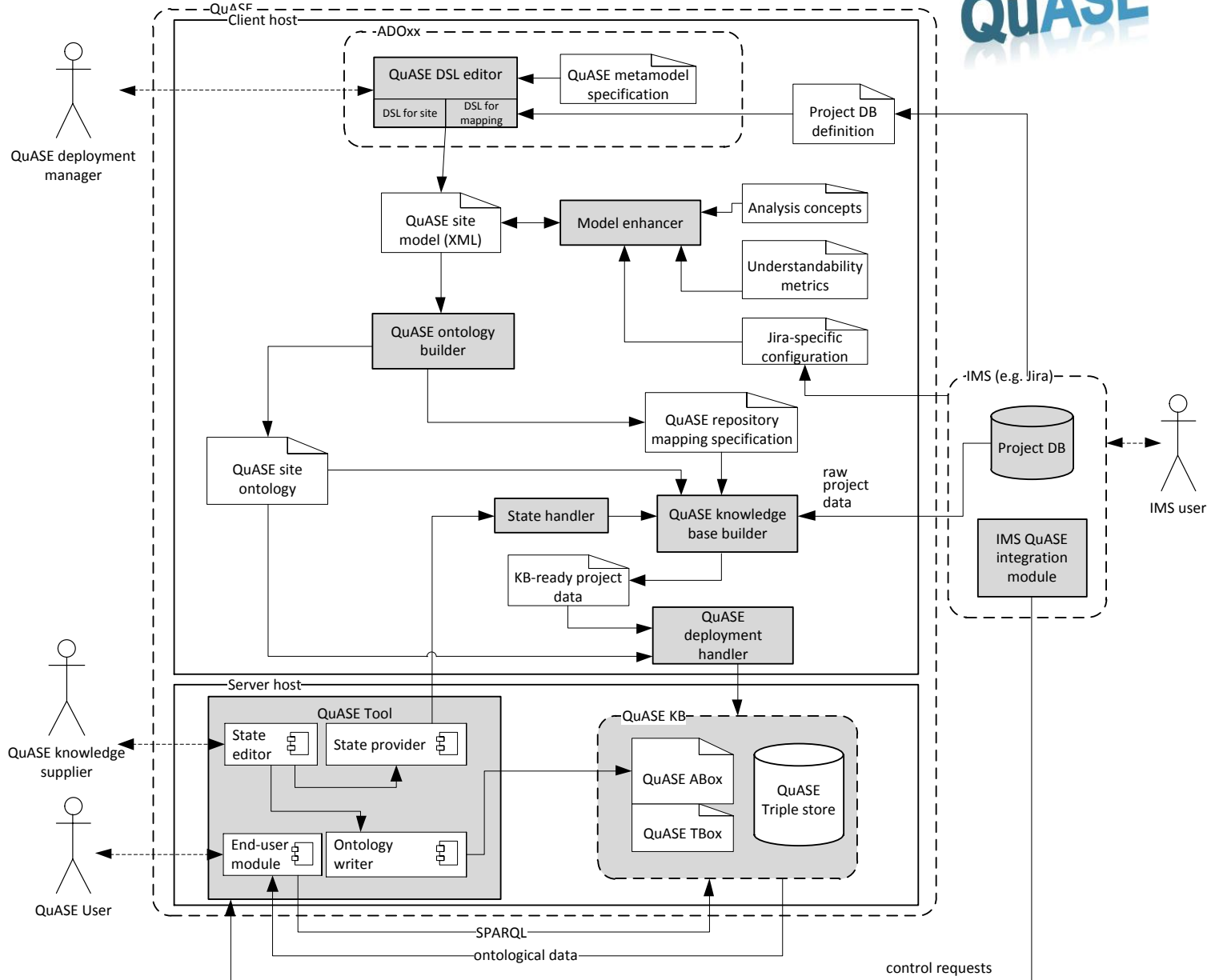
Modeling for

HCM   QuASE

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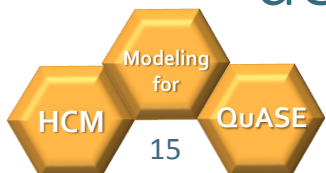# Quality Ontologies

Scope

- **partial**: particular quality characteristics
- **dedicated**: complete quality taxonomy
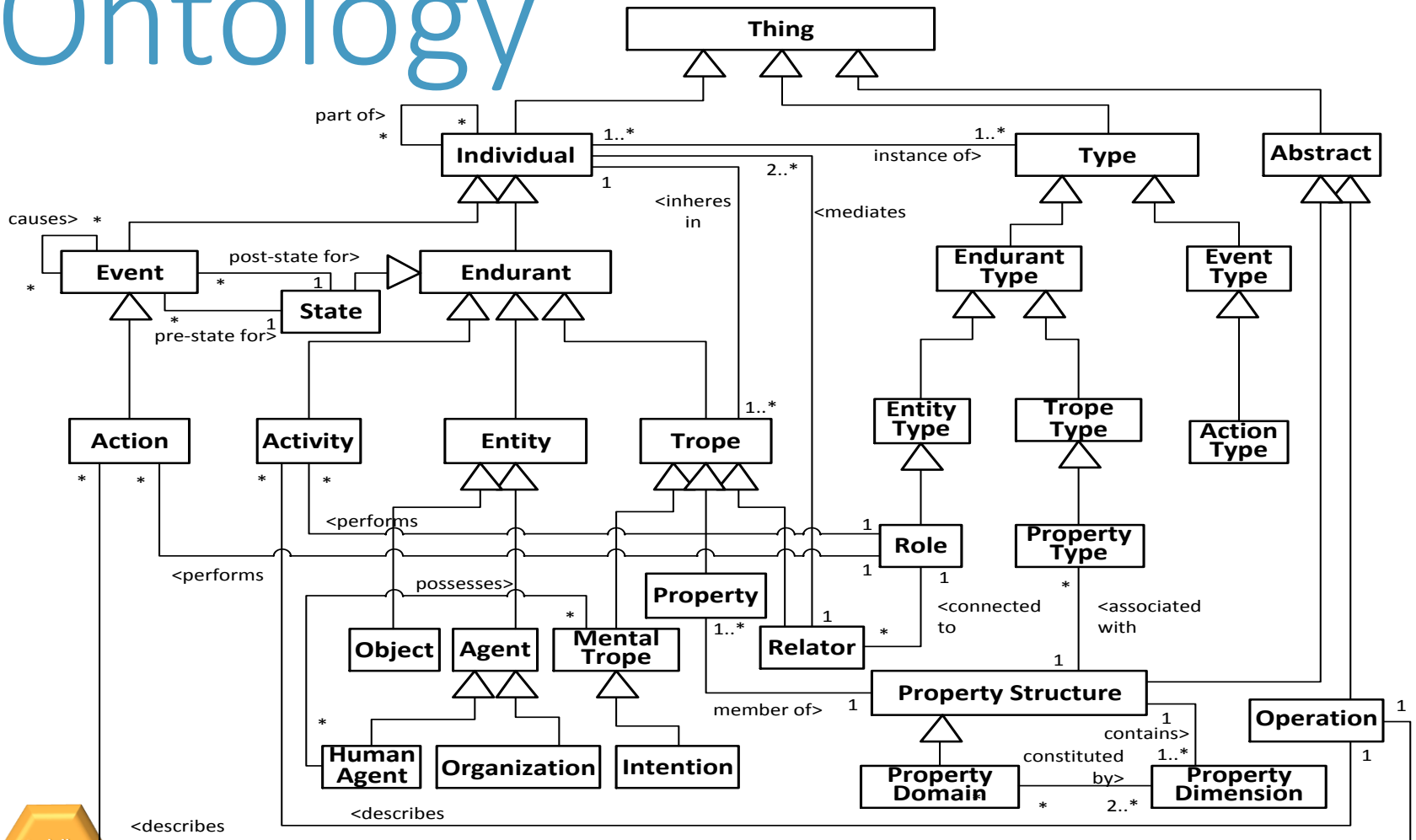
Generalization level

- **concrete**: include complete taxonomies
- **descriptive**: only the taxonomy structure
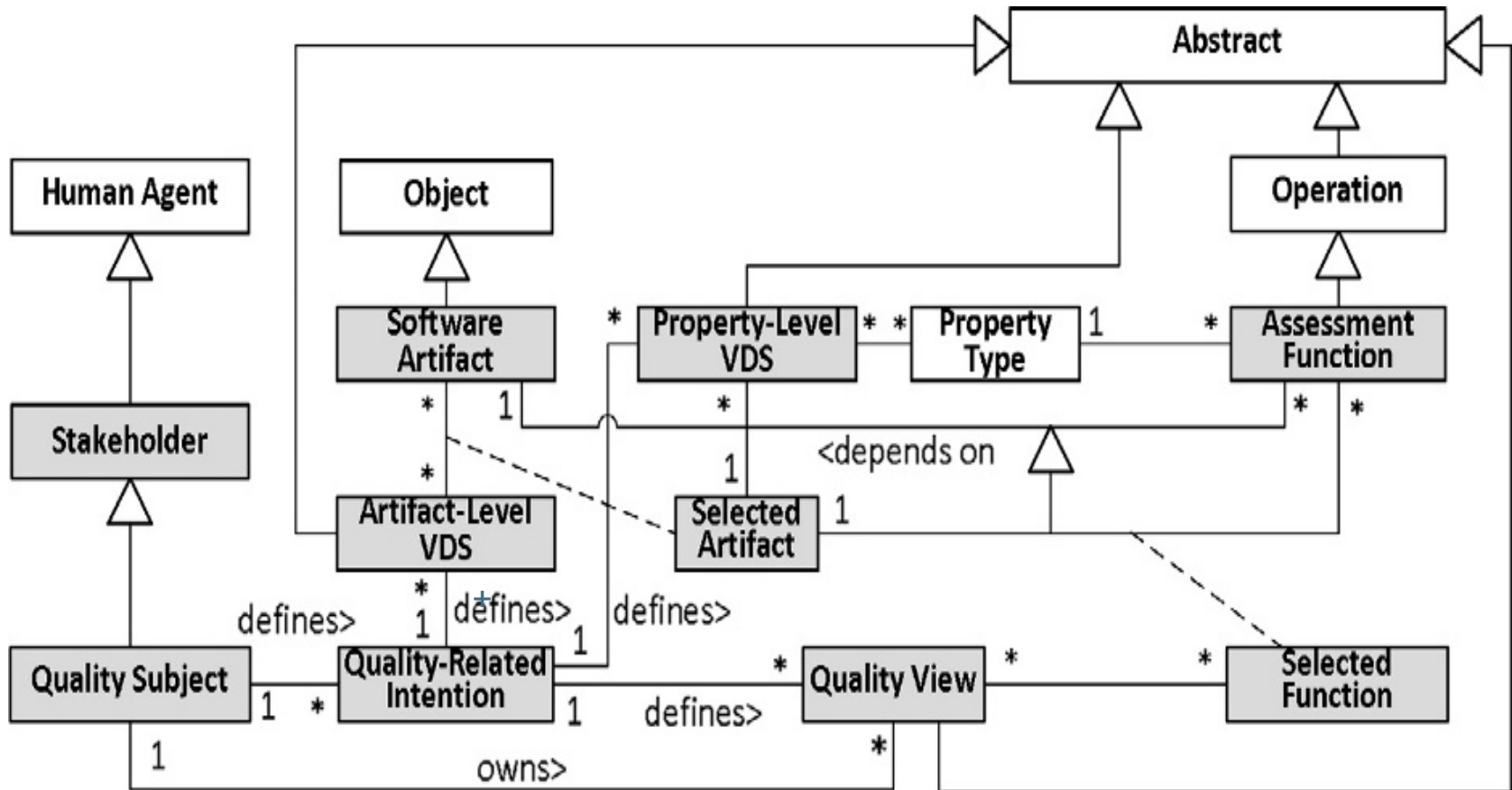
Phase

- development-time, run-time

Unified Foundational Ontology

Adapted from: Guizzardi, G., Zamborlini, V.: A Common Foundational Theory for Bridging Two Levels in Ontology-Driven Conceptual Modeling. In: Software Language Engineering, pp. 286-310. Springer (2013)

HCM Modeling for QuASE

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Spec Level Concepts

Shekhovtsov, V.A.; Mayr, H.C.; Kop, Ch.: Harmonizing the Quality View of Stakeholders. Book Chapter in (Mistrik, I. et al. eds.) : Relating System Quality and Software Architecture. Morgan Kaufmann by Elsevier Inc., 2014, pp 41-73
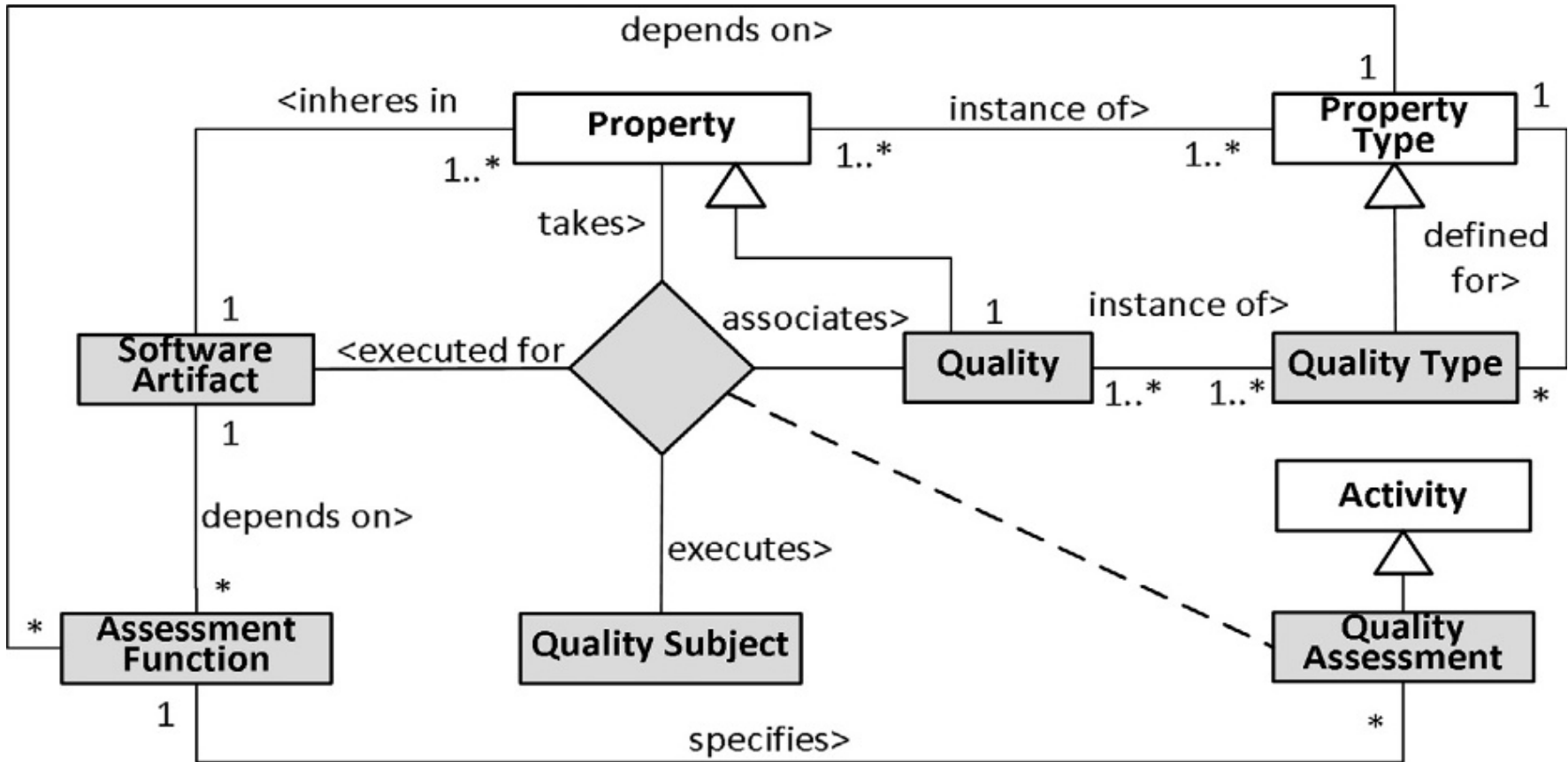
+VDS: View Defining Sets.

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Execution Level Concepts

Shekhovtsov, V.A.; Mayr, H.C.; Kop, Ch.: Harmonizing the Quality View of Stakeholders. Book Chapter in (Mistrik, I. et al. eds.) : Relating System Quality and Software Architecture. Morgan Kaufmann by Elsevier Inc., 2014, pp 41-73

View Harmonization

Underlying Facts
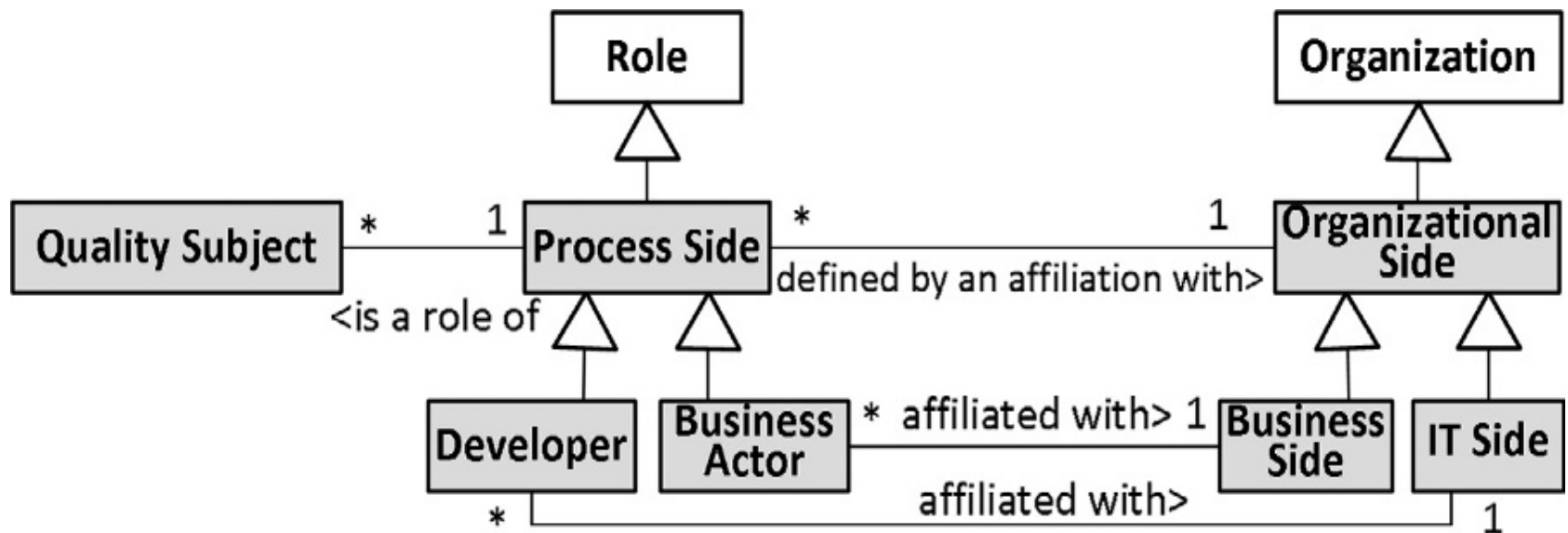

Shekhovtsov, V.A.; Mayr, H.C.; Kop, Ch.: Harmonizing the Quality View of Stakeholders. Book Chapter in (Mistrik, I. et al. eds.) : Relating System Quality and Software Architecture. Morgan Kaufmann by Elsevier Inc., 2014, pp 41-73
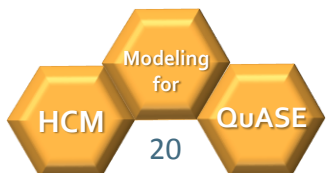
Conclusions

Focus on Requirements: Modeling

Use Domain Specific Modeling Languages Adopt standards

Develop a "quality culture": quality is in the responsibility of every project participant

Use tools like **QuASE**

QuASE papers

- V. Shekhovtsov, H.C. Mayr, S. Ianushkevych, M. Kucko, M., V. Lubenskyi, S.Strell: Implementing tool support for effective stakeholder communication in software development – a project report. In: Ausgewählte Beiträge zur Anwenderkonferenz für Softwarequalität Test und Innovation - ASQT 2014. books@ocg.at, Vol. 310, pp. 45-58. Österreichische Computer Gesellschaft, Wien (2015)

- V. Shekhovtsov, H.C. Mayr, M. Kucko: Implementing tool support for analyzing stakeholder communications in software development. Proc. at IEEE Eighth Int. Conf. on Software Testing, Verification and Validation Workshops (ICSTW 2015, pp. 1-10

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- V. Shekhovtsov, H.C. Mayr, Ch. KopFacilitating Effective Stakeholder Communication in Software Development Processes. In: Nurcan, S., Pimenidis, E. (eds.): Information Systems Engineering in Complex Environments. Springer Int. Publishing 2015, LNBIP, Vol. 204, pp. 116-132.

- V.Shekhovtsov, H.C.Mayr, C.Kop: Harmonizing the Quality View of Stakeholders, Chapter 3. In: Mistrik, I., Bahsoon, R., Eeles, R., Roshandel, R., Stal, M. (eds.): Relating System Quality and Software Architecture. Morgan-Kaufmann (Elsevier imprint), 2014, pp. 41-73

- V. Shekhovtsov, H. C. Mayr: Towards Managing Understandability of Quality-Related Information in Software Development Processes. In ICCSA 2014, Part V., LNCS, vol. 8583, B. Murgante, S. Misra, et al., Eds.: Springer, 2014, pp. 572-585.

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QuASE papers

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- V.Shekhovtsov, H.C.Mayr: Let Stakeholders Define Quality: A Model-Based Approach. In: O. Linssen, M. Kuhrmann (eds.): Qualitätsmanagement und Vorgehensmodelle - 19. Workshop der GI-Fachgruppe Vorgehensmodelle, pp. 101-110. Shaker Verlag GmbH, Aachen (2012)

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- V.Shekhovtsov. On the evolution of quality conceptualization techniques. In: R.Kaschek, L.Delcambre (eds.): The Evolution of Conceptual Modeling. LNCS 6520, Springer, 2011, pp. 117–136. ISBN: 3-642-17504-X

- V.Shekhovtsov, R.Kaschek, C.Kop, H.C.Mayr. Relational service quality modeling. In: N. Milanovic (ed.). Non-Functional Properties in Service Oriented Architecture: Requirements, Models and Methods. IGI Global, 2011, pp.172-193. ISBN: 978-1-6056-6846-8

- R.Kaschek, C.Kop, V.Shekhovtsov, H.C.Mayr. Towards simulation-based quality requirements elicitation: a position paper. In: REFSQ 2008. LNCS 5025, Springer, 2008, pp. 135-140.

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Modeling for

HCM   QuASE

THANKS FOR LISTENING