

Challenges beyond the scientific contributions

Ontologies in existing software development lifecycles and infrastructures

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You are here:



■ Semantic Karlsruhe

- University : Institute AIFB
- Transfer : Research Center on Information Technologies (FZI)
- Spin-off : ontoprise



■ Interfacing with SAP Research CEC Karlsruhe

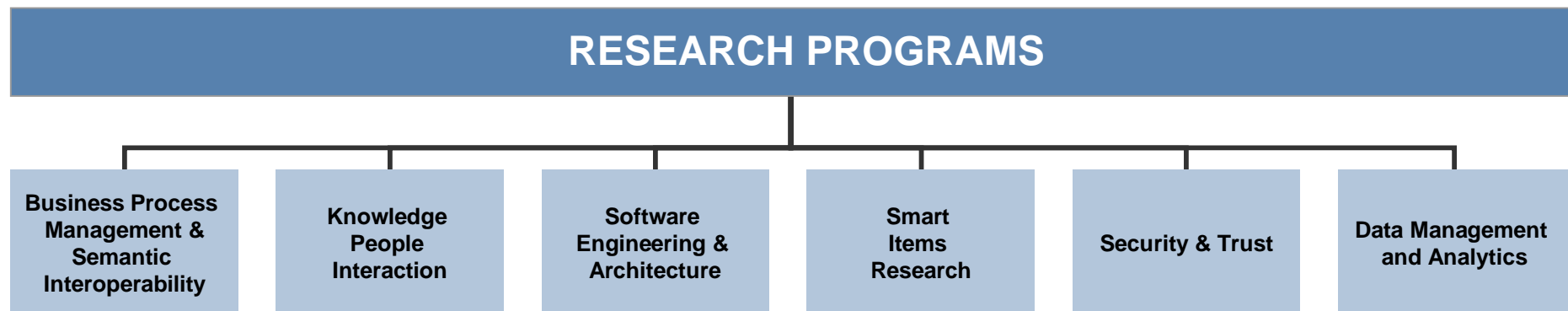
- PhD supervision
- Bilateral cooperation
- Cooperation in publicly funded projects



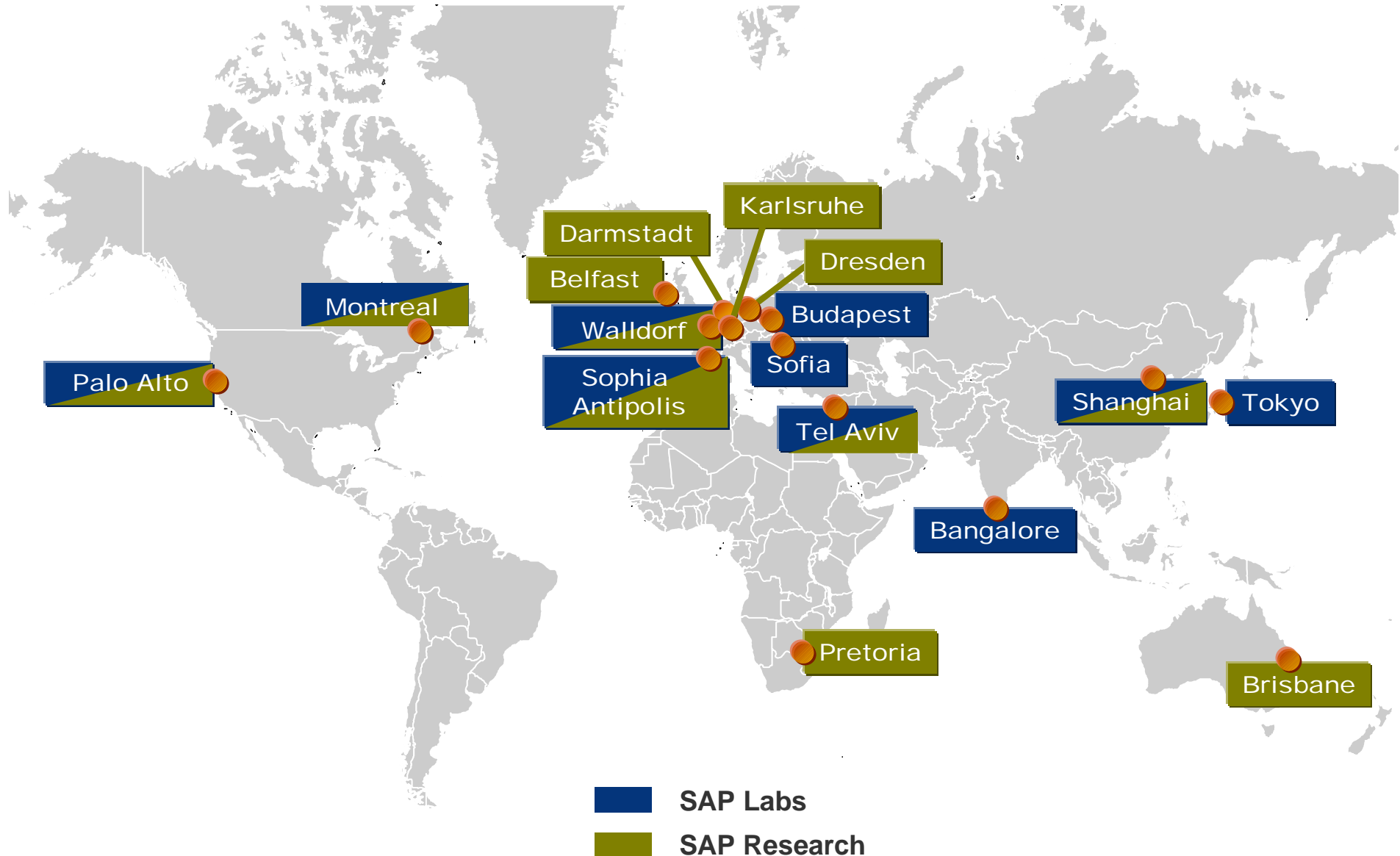
The CEC Karlsruhe & SAP Research Programs



- Campus-based Engineering Center
- Since 1999
- Birthplace of SAP Research
- About 100 employees
 - (Senior) Researchers
 - PhD students
 - Students
- Mission: Trend Scout & Transfer of Research Results



SAP's Research & Development Network



Agenda



1. Introduction

2. Scientific Contributions

3. Challenges

4. Wrap - Up



- Application of ontologies to software engineering
 - Web Services : ++
 - Established Software Engineering approaches : -

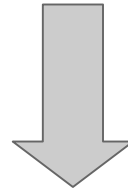
- “Business” Promise: *Increased productivity of software engineering*
 - Cost and time reduction in software engineering
 - Examples are
 - Facilitation of software reuse [Antunes et al 2007]
 - Improved software configuration management [Shahri et al 2007]
 - etc.

 - Quality improvement in software engineering
 - Problems are reduced to reasoning services
 - Example: Problem of discovery [Li & Horrocks 2004]

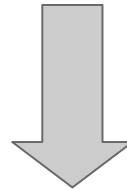
Why is SAP Research interested in SWESE?



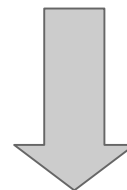
~ 52.000 employees



~ 10.000 developers



~1% increased productivity in software engineering



~15.000.000 € savings p.a.



- MOST = Marrying Ontology and Software Technology
- Leverage ontology technology in MDSD
- Increase productivity in software engineering

- SAP Research is Case Study partner

- *Guidance* in the solution domain
 - business-related constraints guide model-driven development activities
 - e.g., SOX legal constraint
- *Guidance* in the software development lifecycle
 - avoid unnecessary steps
 - improve time-consuming steps
 - avoid pitfalls
 - increase quality



<http://www.most-project.eu/>

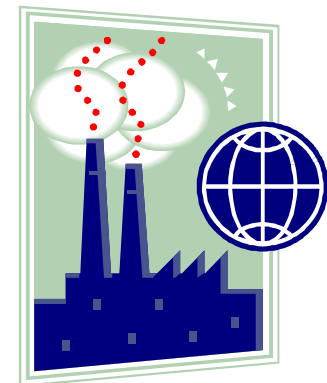
Agenda



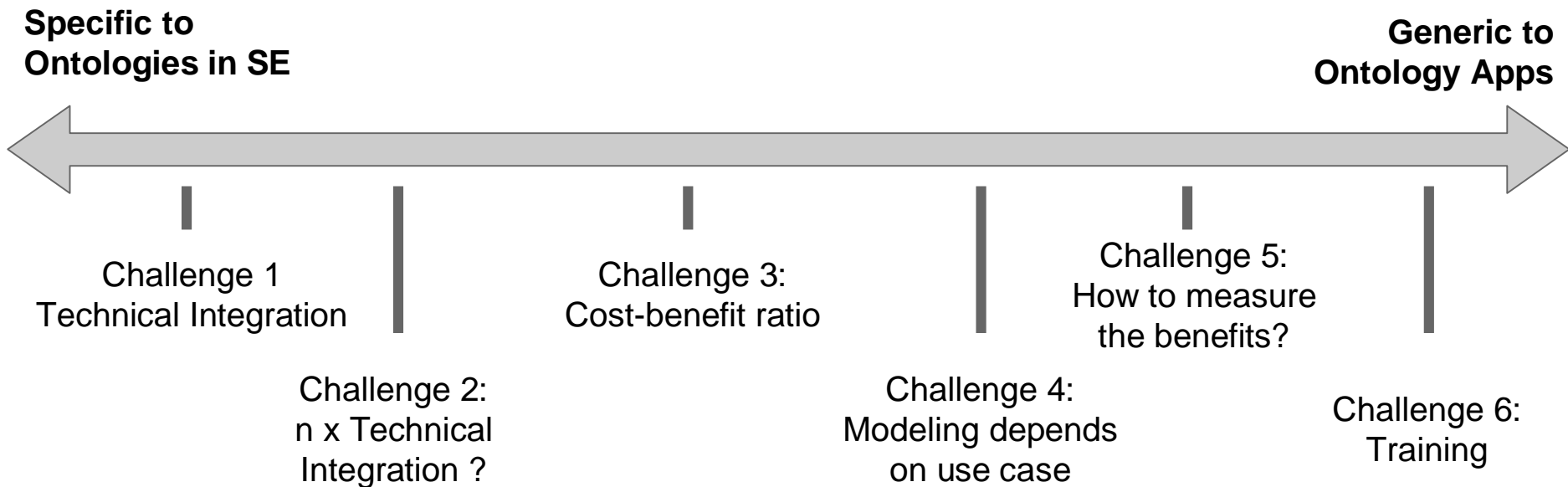
1. Introduction
2. Scientific Contributions
- 3. Challenges**
4. Wrap - Up

- Scientific contributions
 - End with a prototype
 - End with toy examples
 - Consider only one use case
 - Single-user development infrastructure

- Beyond the scientific contributions:
 - Application in enterprise scale setting
 - Boundary conditions
 - Existing software engineering lifecycles
 - Existing software development infrastructures
 - Multi developer situation
 - Multiple use cases



Challenges



Challenge 1 : Technical Integration



- Enterprise scale performance
- Maturity level of tools
- How to handle ontologies in the transport system?
- Ontologies in the SAP software structuring mechanism
- Different use cases at
 - Development time
 - Deployment time
 - Run time
- Reasoner and store in
 - Developer run time
 - Application run time
- etc.

Challenge 2 : $n \times$ Technical Integration?

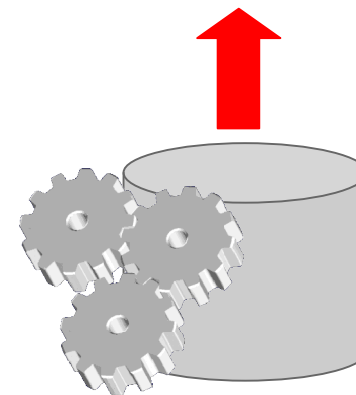


■ Threats:

- Different logics for different use cases
- Different reasoners for different use cases

■ Hope: $n = 1$

- Integrate only one stack
- Integrate only one time
- Realize many use cases with one infrastructure
- Approaches like NeOn

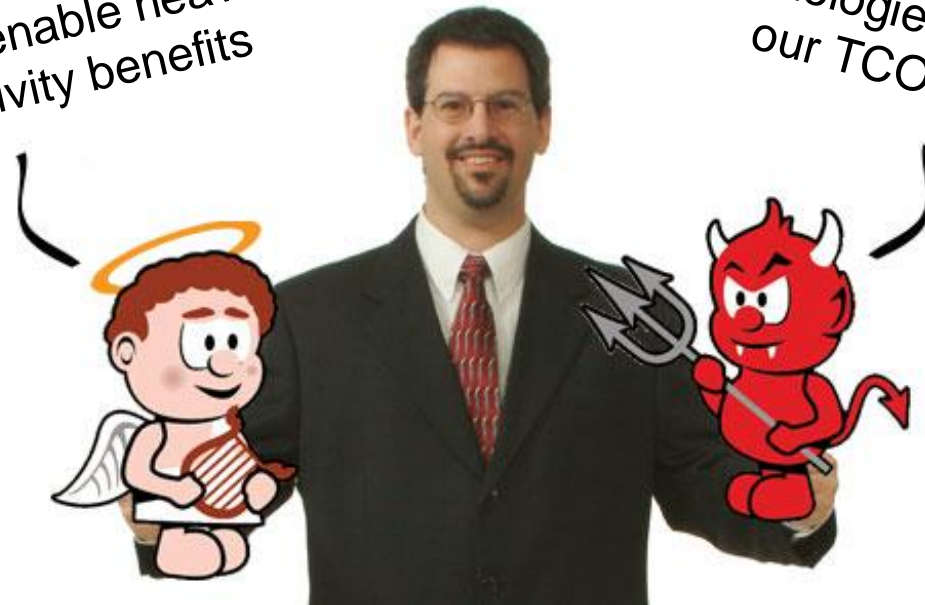


Ontology Reasoner / Store

Challenge 3 : Cost-Benefit Ratio



Ontologies enable heavenly productivity benefits



Ontologies increase our TCO like hell

TCO ~ TCO drivers * # of stacks in landscape * # of technologies

Acquire expertise

Training

Integration costs

Maintenance

Technology buy-in or redevelopment

...

+ n

+ n

Challenge 4 : Modeling depends on use case



- Reuse of ontologies is sought
- Different use cases have different modeling needs
- Reification



- Ontology quality vs. reasoning
 - Example:
 - „Subclass-of“ instead of „part-of“
 - Leverage subsumption reasoning

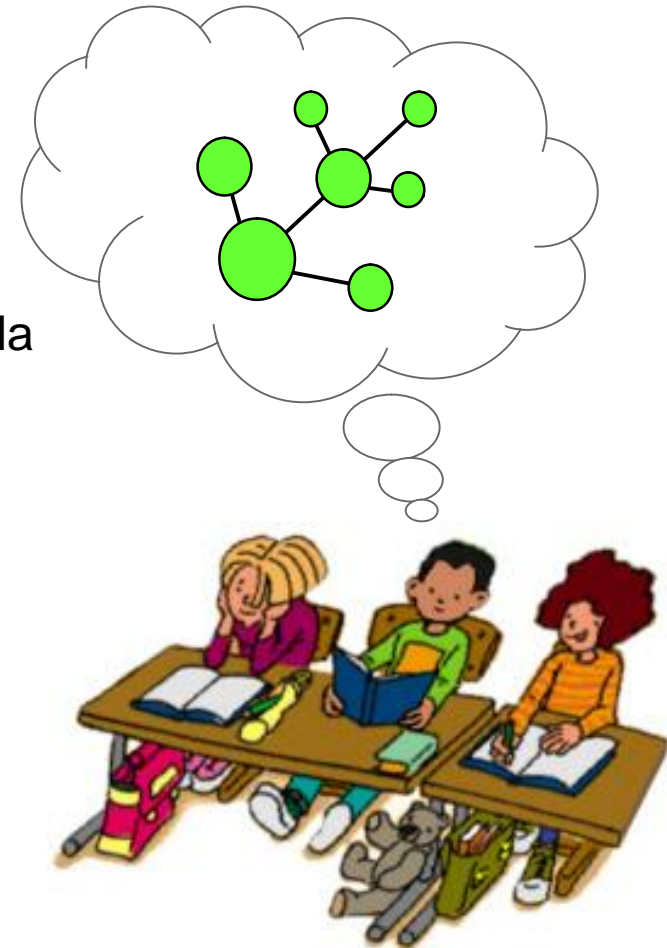
Challenge 5 : How to measure the benefits?

- Scientific contributions often neglect evaluation
- Which measures to apply?
- How to calculate productivity gains?
- What is the Business Case?
- How to convince your manager?



Challenge 6 : Education

- Enough educated newcomers available?
- Expertise has to be acquired
- “Half-trained” people are a threat
- Ontologies must become a standard topic in curricula



Agenda



1. Introduction
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4. **Wrap - Up**

- Application of ontologies to software engineering
 - Web Services over-represented
 - Pick the low hanging fruits: Established Software Engineering approaches

- Be aware of the challenges beyond
 - Challenge 1: Technical Integration
 - Challenge 2: Keep number of technologies as small as possible
 - Challenge 3: Cost-benefit ratio
 - Challenge 4: Modeling depends on use case
 - Challenge 5: How to measure the benefits?

- Include ontologies in standard curriculum
 - Challenge 6: Training



Questions?



Q&A



Thank you!