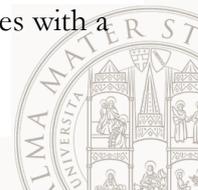


ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

The University of Bologna
AI group @ Faculty of Engineering
Contribution to the NESSI WG on
Business Process Management

Vision

- Today → procedural languages
 - ✓ BPEL, WS-CDL, ...
- Need for **declarative** languages for the specification, verification and execution of business processes / services (see DecSerFlow)
 - ✓ Higher level view
 - ✓ Flexibility/adaptivity
 - ✓ Openness
 - ✓ Autonomous nature of services
 - ✓ Seamless integration between a (partial) flow specification and business rules / policies
 - ✓ Rules + Ontologies
- Need for high-level **graphical** specification languages with a mapping to the underlying formalism(s)
 - ✓ Usability



Current and Future Research Directions

- Smart engines (discovery, **contracting** and composition of web services)
- Computational logic-based **semantics** for standards like WS-BPEL, BPMN, and RuleML
- Automatic **reasoning** on specifications
- Run-time **verification** of compliant behaviour
- A-priori verification of interoperability (**choreographies**)
- Formal proof of **properties**

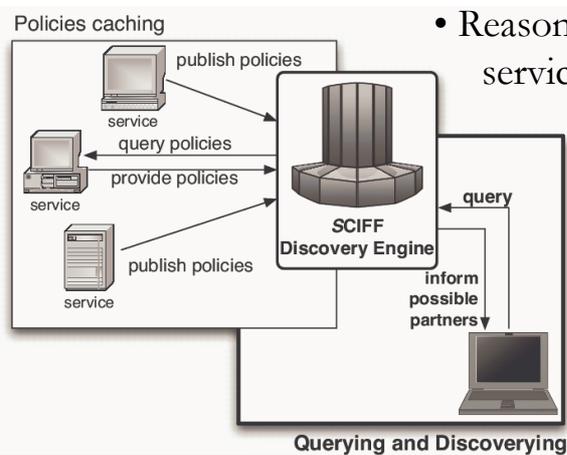
3



Ongoing research: Contracting in Service Discovery Engines

Automatic reasoning on specifications (policies)

- Specifically on contracting
- Reasoning about services and composition
 - Monitoring
 - Learning (ILP)

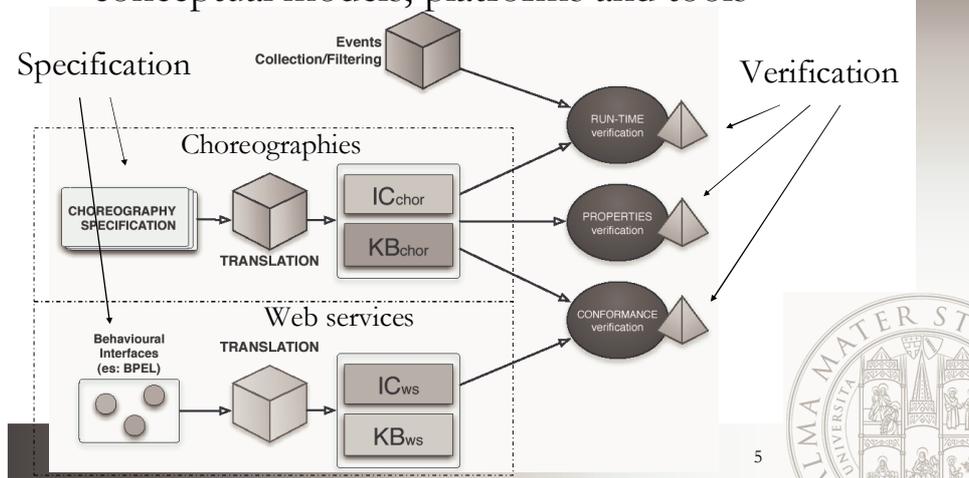


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Ongoing research: Web Services/Choreographies Specification, Semantics, and Verification

Development of computational logic-based
conceptual models, platforms and tools



Applications: health care

- Service-oriented applications in health care
- Knowledge-based systems (logic-/rule-based)
- Aims/Services:
 - ✓ Managing patient care
 - ✓ Assisting the doctors (monitoring, diagnosis)
 - ✓ Supporting health care
 - Quality assessment and assurance
 - Clinical decision
 - Workflow (computerized medical guidelines)

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