Competence Management in Virtual Enterprises – research in progress –

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MOVE (framework)

- Modelling of Virtual Enterprises and their Business Processes
  - Graphical modelling
  - Web Services as components
  - Orchestration Language XPDL
  - Validation of Business Processes
- Planning
  - Optimization of Resources
  - Web Service Composition
- Execution
  - Workflow Management
  - Transaction Management
- Standard components
  - Secure storage of XML data & documents
  - Semantic Access Control

Application Domains

- tourism
  - meta-search
  - dynamic holiday packages
- human resource management
  - staffing
  - project management
- bio-science

Virtual Enterprise

- network of independent companies and organizations,
- often short-term cooperation,
- dedicated partners for common functions (e.g. marketing) and
- often individualized (mass) services for consumers

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- electronic communication,
- electronic search for partners and services,
- ad-hoc contracts,
- electronic negotiation,
- understanding of objectives and
- **trust**

Research Project as Virtual Enterprise

- different research partners
- specific competence profiles of organizations
- task: find the appropriate partners for a given research portfolio
- how do we define the research portfolio (aka of how do we specify the qualification profile for a new team member)

Competence Ontology

- developed at Vienna University of Technology
- focus on Business Computer Science (Wirtschaftsinformatik)
- three sub ontologies
  - computer science (e.g. programming, databases, ...)
  - business science (e.g. controlling, process management, ...)
  - general competencies (e.g. presentation techniques, project management, ...)
- motivation for separation: reuse in different domains

Recursive (hierarchic) Competencies

- a competency may consist of sub-competencies
- project management consists of project planning, control, teamwork, ...
- also applicable to determine competency of an organization
  i.e. the competency is the aggregation of its individuals with an abstraction

Competence Profile

- set of competencies
  - belonging to a person
  - belonging to an organization
  - a person should have or
  - an organization should have
- each competency may have
  - a weight and
  - an evidence

Modelling Competencies with HR-XML

```
<Competency xmlns=http://ns.hr-xml.org/2004-08-02
       xmlns:xsi=http://www.w3.org/2001/XMLSchema-instance
       xsi:schemaLocation=http://ns.hr-xml.org/2004-08-02 Competencies.xsd
       description="Models the experience in project management"
       name="Project Management">
     <CompetencyId id="ProjectManagement" idOwner="VUT"/>
     <TaxonomyId idOwner="VUT" id="1"/>
     <CompetencyEvidence
        dateOfIncident="2002-06-30" name="Course Score"
        typeDescription="VUT test" typeId="Test">
       <EvidenceId description="Test result" id="2002-06-30-34"
        idOwner="VUT"/>
       <NumericValue maxValue="100" minValue="0">89</NumericValue>
     </CompetencyEvidence>
     <CompetencyEvidence dateOfIncident="2002-10-31" name="Experience"
        typeDescription="Month of Experience" typeId="Experience">
       <EvidenceId id="ProjectDocumentation" idOwner="ec3"/>
       <NumericValue description="Project size in pm">90</NumericValue>
     </CompetencyEvidence>
     <CompetencyWeight type="levelOfInterest">
     <NumericValue description="ec3 Scale 100 point" maxValue="100"
        minValue="0">90</NumericValue>
     </CompetencyWeight>
</Competency>
```

Competencies of an Organization

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▪<Competency name="ProjectManagement">
   <CompetencyId id="27" idOwner="VUT"/>
   <TaxonomyId idOwner="VUT" id="1"/>
   <CompetencyEvidence
       dateOfIncident="2006-01-31" typeDescription="aggregatedCore">
      <NumericValue maxValue="100" minValue="0">53</NumericValue>
   </CompetencyEvidence>
   <Competency name="ProjectPlanning"> typeId="Experience">
      <EvidenceId id="aggregation" idOwner="ec3"/>
      <NumericValue description="planning experience in
               pm">9</NumericValue>
   </CompetencyEvidence>
   <CompetencyWeight type="strategicFocus">
   <NumericValue description="ec3 Scale 100 point" maxValue="1.0"
       minValue="0">0.2</NumericValue>
   </CompetencyWeight>
</Competency>
```

Measurement of Competencies (part of ontology)

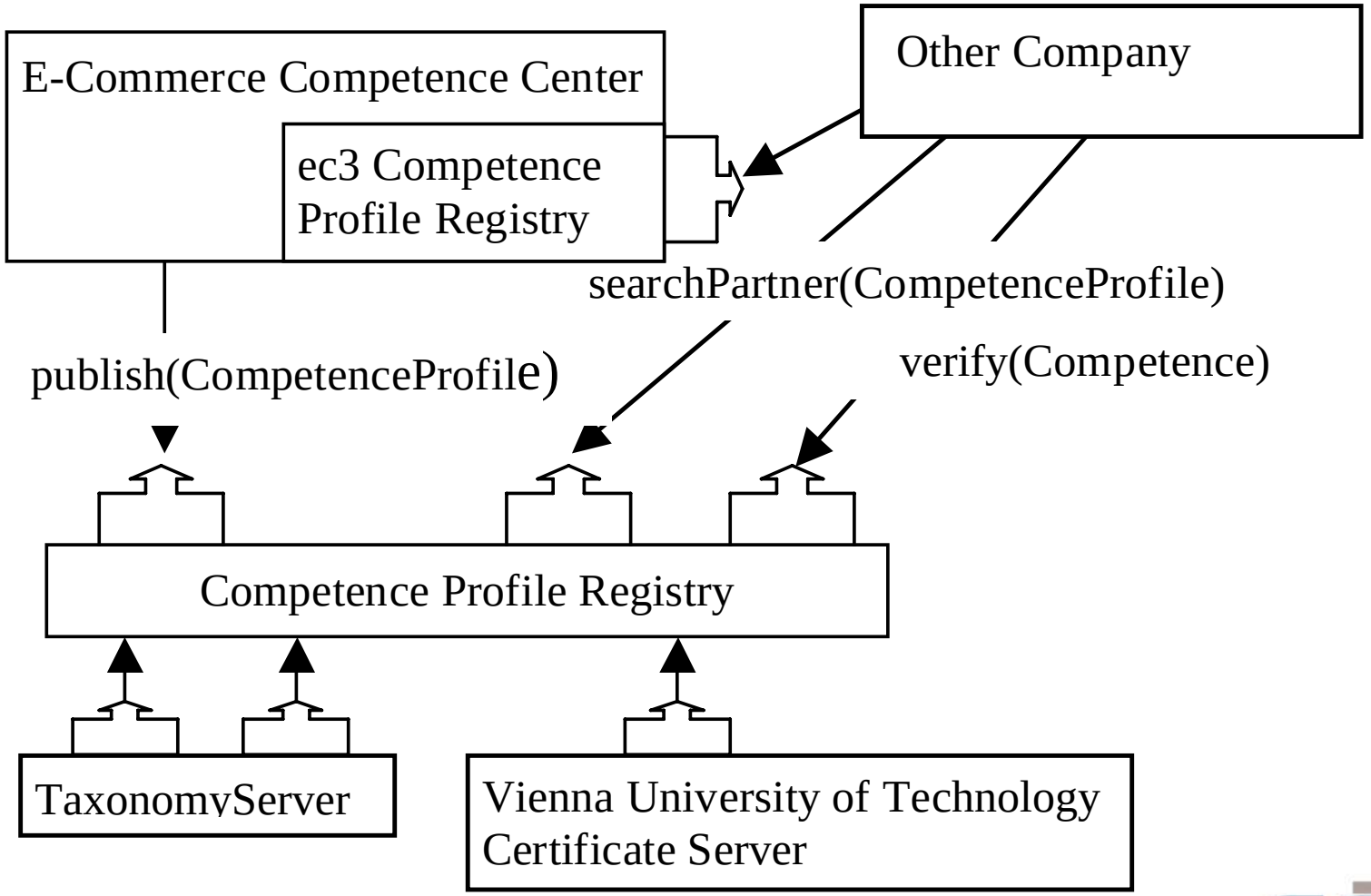
- scale of evaluation
  - finite domain (e.g. bad, medium or good programmer)
  - fuzzy domain
  - infinite domain
- calibration
  - what does it mean to be a good programmer?
  - reproducible evaluations by different reviewers!

Competence Storage

- SemCrypt project
  - storage of XML data and documents on untrusted servers
  - encryption of XML structures in a trusted domain

- business models
  - lifelong university service for students
  - recruiting companies
  - company competence management system

Service-oriented Architecture



Open Issues

- consistent evaluation (still open)
- privacy concerns
- trust management
- competence algebra
  - aggregation of competencies
  - aging of competencies
- consistency mechanism