inContext – On Coupling and Sharing Context for Collaborative Teams

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http://www.in-context.eu

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✓ Motivation
✓ Design time context coupling
✓ Runtime context coupling
✓ Illustrating examples
✓ Conclusion and future work
Coordinated by TU Wien (AT)
A user needs different services even for a single activity

- How to enable services from different providers to become aware of the overall collaboration context
  - Services need context from preceding „steps“
  - Services should require minimum user interventions
✓ E-professional knows his/her part of collaborative process
  • links between actions, relations between users, relevant resources, artifacts, etc.
✓ However, services are limited to compositions within applications

→ Context coupling techniques enrich services with overall collaboration context and link context across user boundaries
To enable context-aware collaboration services

- Need to have explicit context information models
  - Well-defined models for associating diverse types of context in today’s team collaboration
- Need a mechanism to correlate and manage context for collaboration services
  - Service independent approach
  - Across distributed, service-based environments

This paper focuses on

- Context coupling techniques at design-time and runtime for SOAP-based collaboration services
Requirements for Context Coupling

- Need both design-time and runtime context coupling techniques
  - Collaboration context across user boundaries

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Model individual context, team context and activity context using RDF

Support flexible and extensible models by including domain-specific context models and reusing common RDF context models

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Runtime Context Coupling Techniques

✓ Supporting distributed context management
✓ Using URI to retrieve context information
  • ActivityURI and UserURI
✓ Embedding URIs specifying context information into SOAP message header
  • No application-specific source code
  • Extensible mechanism
✓ Supporting RDF/XML context information
  • XSPARQL for querying context data and transforming RDF to XML
<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope
    ... 
<soapenv:Header>
    <ns1:ctxtunnelling
        soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
        soapenv:mustUnderstand="0" xmlns:ns1="www.in-context.eu">
        <ns1:Activity>
            <ns1:Activity>
                http://www.in-context.eu/pcsar#act1
            </ns1:Activity>
        <ns1:User>
            <ns1:User>
                http://www.in-context.eu/pcsar#Rossi.E54
            </ns1:User>
        </ns1:ctxtunnelling>
    </soapenv:Header>
    <soapenv:Body>
        ... 
    </soapenv:Body>
</soapenv:Envelope>
✓ **Context Tunneling Handler**
  - SOAP Header extensions: carry over User/Activity ID in service calls, enables tunnelling, monitoring, mining
  - Prototypes for AXIS1, AXIS2 and .NET
  - Context aware services can exploit it, but no obligation → no specific change for services
  - Enable context ranking and constraints

✓ **Different high-level interfaces to the Context Store**
  - getContext(XML, XSPARQL)
  - setContext(XML,SPARUL)
inContext techniques for coupling and sharing context for today’s collaboration services

- Developed generic RDF/OWL-based context models
- Provided generic runtime service-based context coupling framework: SOAP header extensions, distributed context management, XSPARQL
- Based on multidisciplinary research efforts: Web services engineering + ontology/semantics + collaborative computing

Working on a reference architecture for context-aware collaboration services

Utilizing context coupling and sharing techniques for the FP7 COIN IP to support human interactions in collaboration
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What: the inContext demo, much more than this talk
When: Tue, 24 (tomorrow)
   - during the coffee breaks
   - at 10 am and 15 pm
Where: the coffee room
Who: you and the inContext team
How: live demo and discussion