RGPS Overview

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- Background
- RGPS metamodels
- RGPS based tools
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Background
IT Evolution

From: The fortune of the commons. In Coming of Age - A New Era of the IT Industry. The Economist, May 8th 2003

Objective: Provide On-demand Services for Users (Developer/End User)
Service is Flourishing...

Cloud Computing: XaaS

SOA

SaaS
Software as a Service

PaaS
Platform as a Service

IaaS
Infrastructure as a Service
Meet in Middle

Personalized requirements
Common requirements
Requirements Elicitation and Analysis
On-demand Service Provision
Service Aggregation
Computing service
Software Service
Storage Service
Platform Service
Networked Environment

User Centric
RGPS Metamodels
Service Oriented
Objectives of RGPS

- RGPS provides a framework for the management, discovery and sharing of service-related models.
  - RGPS consists of several views of services, which can be used to capture user’s requirement.
  - According to the mapping between user’s requirement and the RGPS registration information, appropriate models/services can be selected to satisfy user’s intention.
  - Semantic annotations will be used to express the relationship between service-related models and domain ontologies.
RGPS Metamodels
RGPS Metamodels

**Metamodel of Process Registration**

- **Actor** plays **Role**
  - 1..* prefers 0..* 1..1 takesCharge

- **Personal Goal**
- **Role Goal**

- **NonFunctional Goal** contributes 1..1 achieves

- **Process** 1..1 realizes 0..*

- **Service**
A simple example of RGPS

Role
MFI-8

Goal

Process
MFI-5

Service
MFI-7

Housewife

Cook delicious food

1. Plan
2. Gather ingredients
3. Cook
4. Serve

MFI-7
Semantic Annotation of RGPS models

Can be used to
• capture and analyze user’s requirements
• mapping between model/service
On Demand Model Selection (MFI-9)

- Role and Goal Registry based on MFI-8
- Process Registry based on MFI-5
- Service Registry based on MFI-7

Registration

- BMM
- Tropos
- RM-ODP
- FOAF

Interoperation

- BPEL
- PSL
- UML
- OPM
- WSDL
- WADL
- OWL-S
- WSMO
MFI-9: On-Demand Model Selection (1/2)

A typical case
MFI-9: On-Demand Model Selection (2/2)

Another typical case
RGPS based tools
O-RGPS Domain Modeling Tool

Service Registration
An Example in Urban Transportation Domain
Registering Web Services based on Domain Ontologies

- Semantic annotation based on domain ontologies
- Web service discovery based on semantic annotation
Requirements Elicitation and Analysis Tool based on RGPS
Relationship with RM-ODP
What is ODP

RGPS focuses on the management and sharing of domain models. It aims to promote the interoperation between systems.

RGPS will not cover all the aspects of information systems.

ODP system specifications

The Reference Model of ODP (ITU-T Rec X.901-904 | ISO/IEC 10746) defines a framework for system specification, covering all aspects of open distributed systems:

- "enterprise" context, functionality, distribution, infrastructure technology
- It comprises a structure for system specifications in terms of viewpoints language (concepts and rules) for expressing each viewpoint
- It is part of object-oriented foundation modeling concepts common to all viewpoint languages

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Content of ODP(1/6)
The enterprise specification

- Specifies the roles played by an IT system in its organisational environment
- An object model of a social/commercial organisation in terms of:
  - enterprise objects
  - communities (of enterprise objects)
    - objectives
    - behaviour
      - roles (fulfilled by enterprise objects in a community)
      - processes (meeting objectives)
    - Policy
    - ...

The information specification

- Specifies system behaviour to meet its objectives abstracted from implementation
- An object model of the system describing the semantics of information and of information processing in the system in terms of:
  - information objects
  - invariant schema - predicates on information objects that must always be true
  - static schema - state of information objects at some location in time
  - dynamic schema - allowable state changes of information objects
The computational specification

- Specifies computational structure in terms of units of functionality and distribution and their interactions
- An object model of the system describing the structure of processing in terms of:
  - computational objects
  - interfaces: operations supported
  - invocations: operations invoked
  - computational bindings
  - environmental contracts: QoS constraints
  - ...
The engineering specification

- Specifies the mechanisms and services to provide the distribution transparencies and meet QoS constraints required by the system.
- An object model of the system describing the infrastructure supporting the computational structure:
  - basic engineering objects
  - (infrastructure) engineering objects
  - clusters, capsules, nodes
  - channels
  - functions

System error!
The technology specification

- Specifies the hardware and software pieces from which the system is built.

- An object model of the system
  - defining the configuration of technology objects that comprise the ODP system, and the interfaces between them
  - identifying conformance points
ISO/IEC 19793:2008 (Update of ODP)
Relationship between ODP and RGPS
Things to try

- Register the models which confirm to ODP specifications in RGPS registry
- Reuse the models which have been registered in RPGS registry in the ODP modeling process
Summary
Summary

- MFI-8: Role and Goal Registration
- MFI-5: Process Registration
- MFI-7: Service Registration
- MFI-9: On-Demand Model Selection

Characteristics of RGPS
- Meet in Middle
  - User Centric + Service Oriented
- Semantic Annotation