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Conference website:
http://www.oi.ox.ac.uk/microsites/eresearch08/index.cfm

Conference papers collection:
http://ora.ouls.ox.ac.uk/objects/uuid%3A64aa6f39-7e81-4d42-a008-ee2d7524bd67

Conference organisers:

Oxford Internet Institute
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Oxford e-Research Centre
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Towards a collective Knowledge Base: sharing the expertise acquired on developing Grid-based e-Science and e-Social Science applications

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The paper is a collateral effect of elUS project and highlights related findings.

- Brief State of the Art and Current Motivation
- Approach Overview
- An Example of Applying the Approach: GEMEDA
- Concluding Comments
JISC-funded e-Infrastructure community engagement and support projects

eIUS project

eIUS aims to study current and planned usage of e-Infrastructure across research communities
Main outcomes

1. eIUS experience reports
2. eIUS use cases

♦ Service Usage Models (SUMs)
♦ SUMs diagrams
1. eIUS experience reports

Give concrete examples of the use of existing e-Infrastructure by named individuals or groups of researchers

- Short interviews with active researchers (interview data)
- Additional desk research, etc (any supporting materials)
2. eIUS Use Cases

Idealised “stories” or scenarios that show how active researchers currently use e-Infrastructure to achieve concrete research goals

- eIUS Use Cases differ from the use cases developed in Software Engineering
- Each eIUS Use Case is linked back to a series of eIUS Experience Reports (traceability)
Long eIUS use cases

Narrative Text
- Distinct numbered steps/paragraphs
- Summary of ICTs
- List of resources/references
- Commentary
- Comments by Informant

Short eIUS use cases

Text & Images

Linkage

Sally launches the portal in order to check over the data she wanted to discuss with John. Because Sally had already signed onto her university’s bibliographic and data access system, she does not need to register with the portal or the underlying computing systems it uses because it is also controlled under the UK access management federation for higher education.
Presentation’s outline

- Brief State of the Art and Current Motivation
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Repositories and Catalogs
e-Science projects

http://www.jisc.ac.uk/whatwedo/projects.aspx

♣ Filter projects alphabetically
♣ Filter projects by status

http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/

♣ Social Sciences Repository:
   By Year; By Author; By Journal;
   By Discipline; By Type; By title

and many more

http://www.nesc.ac.uk/projects/

♣ List Projects: By Title; By Acronym;
   By Start Date

http://www.ncess.ac.uk/research/pilot_projects/

♣ Classification of Projects:
   By Components; By Application Area;
   By Funding Agency

http://www.jisc.ac.uk/whatwedo/projects.aspx

♣ Browse by category:
   All Public Projects; Not software; Commissioned Software;
   Contributed Software; Packaged Software; External
   Software; External Service; Unevaluated Software; Uses
   OMII Software

♣ List Projects
e-Science
Knowledge legacy

How to facilitate understanding and sharing the expertise acquired in using GRIDs and developing e-Science Grid-based applications?

Before it may well be scattered or lost entirely
Grid services

Frameworks and prototypes
- ODESGS
- KGBIECRS
- Semantic-OGSA

Grid workflow engines
- Taverna
- Triana
- Kepler

... ... ...
Presentation’s outline

- Brief State of the Art and Current Motivation
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Approach proposed

Open Grid Service Architecture (OGSA)

Service Usage Models (SUMs) of the e-Framework

Classification of Grid Services

Meaningful Common Knowledge Base

SUMs diagrams
Business Processes; Service Genres; Data Sources

OWL(-S)
Open Grid Service Architecture (OGSA)

It specifies high-level services and sub-types including:

- **Infrastructure services**: WS-Resource Framework (WSRF), WS-Notification (WSN), etc
- **Execution management services**: Job Management, Execution Planning, Workflow Management, etc
- **Data services**: Access, Integration, Provision, etc
- **Resource management services**: Deployment, Configuration, etc
- **Security services**: Authentication, Authorization, etc
- **Self-management services**: QoS Management, Optimization, etc
- **Information services**: Event Management, Trouble-shooting, etc
OWL-S upper ontology extended with a taxonomy of Grid Services based on OGSA
Protégé: some OWL classes of an ontology of Grid services based on OGSA

```xml
<owl:Class rdf:about="#Grid_Service">
    <rdfs:subClassOf rdf:resource="#owl:Thing"/>
</owl:Class>

<owl:Class rdf:ID="OGSA_Infrastructure_Service">
    <rdfs:subClassOf rdf:resource="#Grid_Service"/>
</owl:Class>

<owl:Class rdf:ID="OGSA_Execution_Management_Service">
    <rdfs:subClassOf rdf:resource="#Grid_Service"/>
</owl:Class>

<owl:Class rdf:ID="OGSA_Data_Service">
    <rdfs:subClassOf rdf:resource="#Grid_Service"/>
</owl:Class>

<owl:Class rdf:ID="OGSA_Resource_Management_Service">
    <rdfs:subClassOf rdf:resource="#Grid_Service"/>
</owl:Class>

<owl:Class rdf:ID="OGSA_Security_Service">
    <rdfs:subClassOf rdf:resource="#Grid_Service"/>
</owl:Class>

<owl:Class rdf:ID="OGSA_Self-Management_Service">
    <rdfs:subClassOf rdf:resource="#Grid_Service"/>
</owl:Class>

<owl:Class rdf:ID="Authentication">
    <rdfs:subClassOf rdf:resource="#OGSA_Security_Service"/>
</owl:Class>

<owl:Class rdf:ID="Authorization">
    <rdfs:subClassOf rdf:resource="#OGSA_Security_Service"/>
</owl:Class>
```
OWL-S Service Process Model
and its relation with Grid Services
Presentation’s outline

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- Concluding Comments
Applying the approach

GEMEDA

Empirical economic modelling using secondary information
1) data handling,
2) econometric computation,
3) results presentation or visualisation
Applying the approach: GEMEDA

- **Data services instance** – provides the functionality to extract the required data
- **Execution management services instance** – provides the functionality to execute an static workflow
- **Security services instance** – provides the functionality to facilitate a single sign-on
- **Resource management services instance** – manages the required resources in a grid environment
- **Infrastructure services instance** – provides the functionality to perform the econometric computations
Concluding Comments

Time to preserve the *knowledge legacy of using GRIDs* and *developing e-Science Grid-based applications* *before it may well be scattered or lost entirely*.

Tendencies in e-Science are towards fostering *service reuse*.

Time to coordinate efforts and *go beyond documenting-centric approaches*.
Concluding Comments

Approach presented proposes to Combine 3 existing service-oriented approaches

- **e-Framework SUMs** — possible graphical standardise representation at a high level abstraction Grid services
- **OGSA** — reliable classification of Grid services according to their capabilities
- **OWL(-S)** — formal descriptions of Grid Services will pave the way for forthcoming more powerful service-oriented frameworks
Many thanks!

**eIUS project related websites:**
- http://engage.ac.uk/eIUS
- http://www.eius.ac.uk/

Examples of eIUS Use Cases and more at:
- http://www.eius.ac.uk/scoping/eIUS-Scoping-einfrastucture.pdf

Email: eius@oucs.ox.ac.uk

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