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The OMII Experience

Software and Sustainability

David De Roure



Overview

- e-Science context
- From OMII Phase 1 to OMII-UK
- How OMII-UK works
- The Managed Programme
- Governance
- Discussion



Credits

- Southampton
 - Centre and Managed Programme team led by David De Roure and Steven Newhouse (OMII-UK Director)
- Edinburgh
 - OGSA-DAI team led by Malcolm Atkinson
- Manchester
 - myGrid team led by Carole Goble
- The Managed Programme Partners



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e-Science Context



Vision: e-Science

e-Science is about global collaboration in key areas of science and the next generation of [computing] infrastructure that will enable it.

e-Science will change the dynamic of the way science is undertaken.

John Taylor, Director General of UK Research Councils in 2001



Vision: Grid

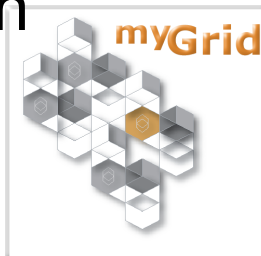
Grid computing has emerged as an important new field, distinguished from conventional distributed computing by its focus on large-scale resource sharing, innovative applications, and, in some cases, high-performance orientation...we [define] the "Grid problem" as *flexible, secure, coordinated resource sharing* among dynamic collections of individuals, institutions, and resources - what we refer to as **virtual organizations**

From "The Anatomy of the Grid: Enabling Scalable Virtual Organizations" by Foster, Kesselman and Tuecke

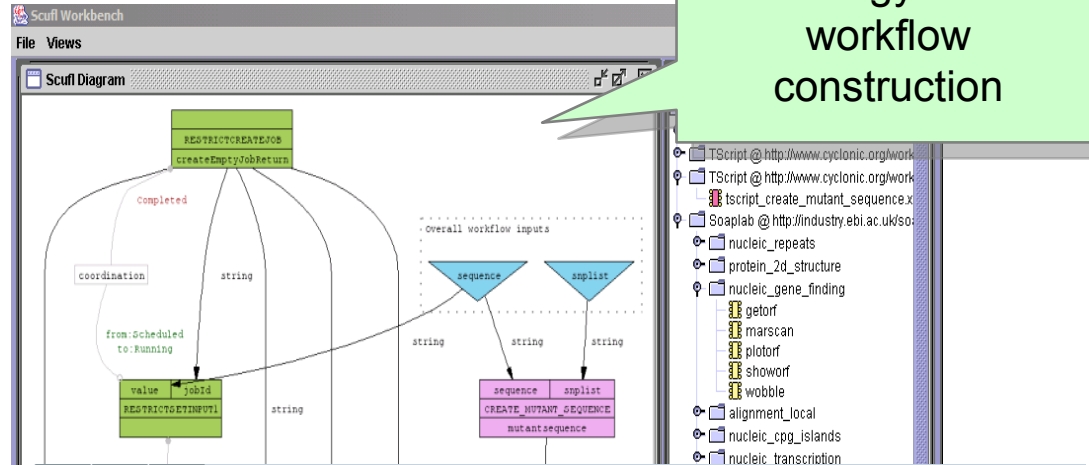


eg myGrid

- large numbers of services
- workflow
- service and data registries
- provenance graphs
- controlled vocabularies for database content
- OWL based integration



April 2006



Ontology-aided workflow construction

Workflow Provenance Data

Workflow overall summary

Taverna Workflow Instance ID	FlowID:Taverna:Workflow.org.embl.ebi.escience.scuff.ScuffModel@ec6bb1:2342::1055286846953
Status	COMPLETE
Start Time	2003.06.11 00:14:06
End Time	2003.06.11 00:14:08
User	user:cs.man.ac.uk/robertstevens

RDF-based semantic mark up of results, logs, notes, data entries

Invoked Services Details

SOAPLAB SERVICE	http://industry.ebi
Status	COMPLETE
Start Time	2003.06.11 00:14:06:988
End Time	2003.06.11 00:14:08:890
Soaplab status	0



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From Phase 1 to OMII-UK

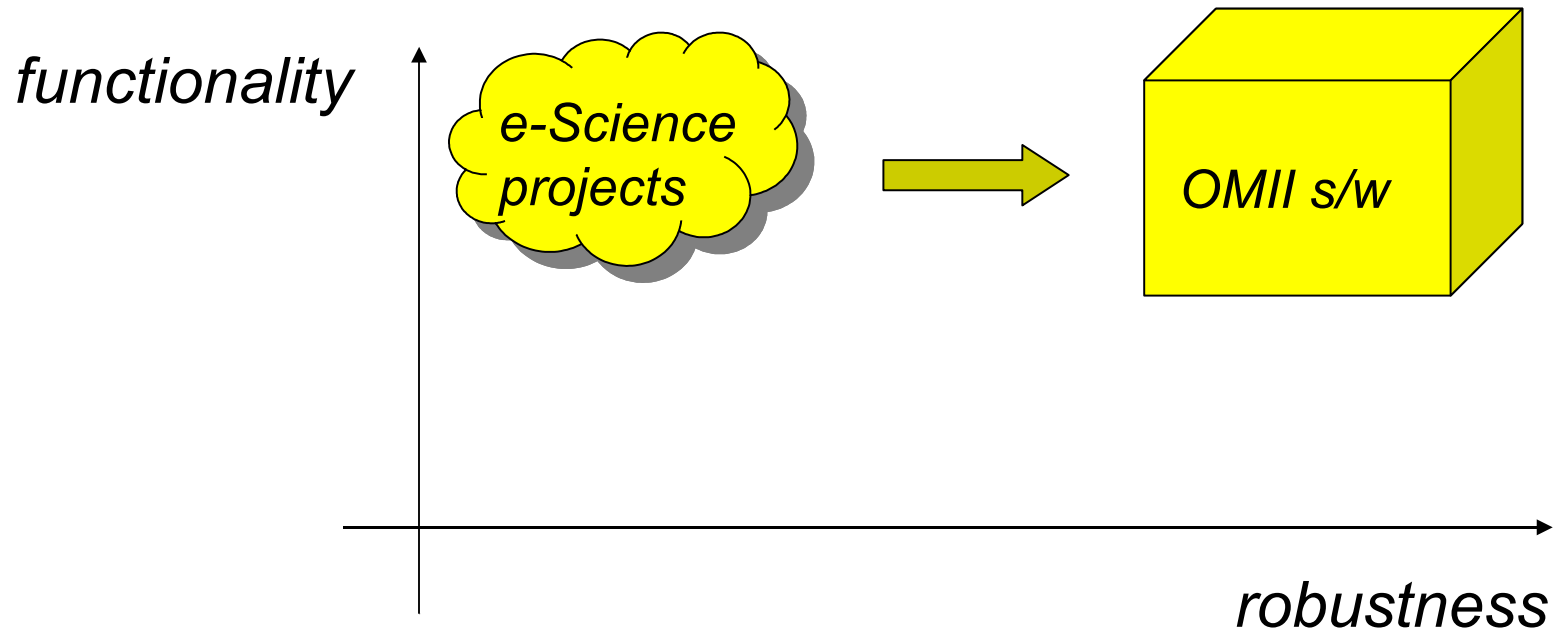


Motivation

- The e-Science programme (research councils + industry), is generating advanced, internationally leading tools, components and services to support e-Research
- By capturing these outputs and sustaining the associated expertise, OMII-UK provides a unique software offering with added value over basic middleware provision
- The OMII-UK is itself a unique operation which others are looking to as a model

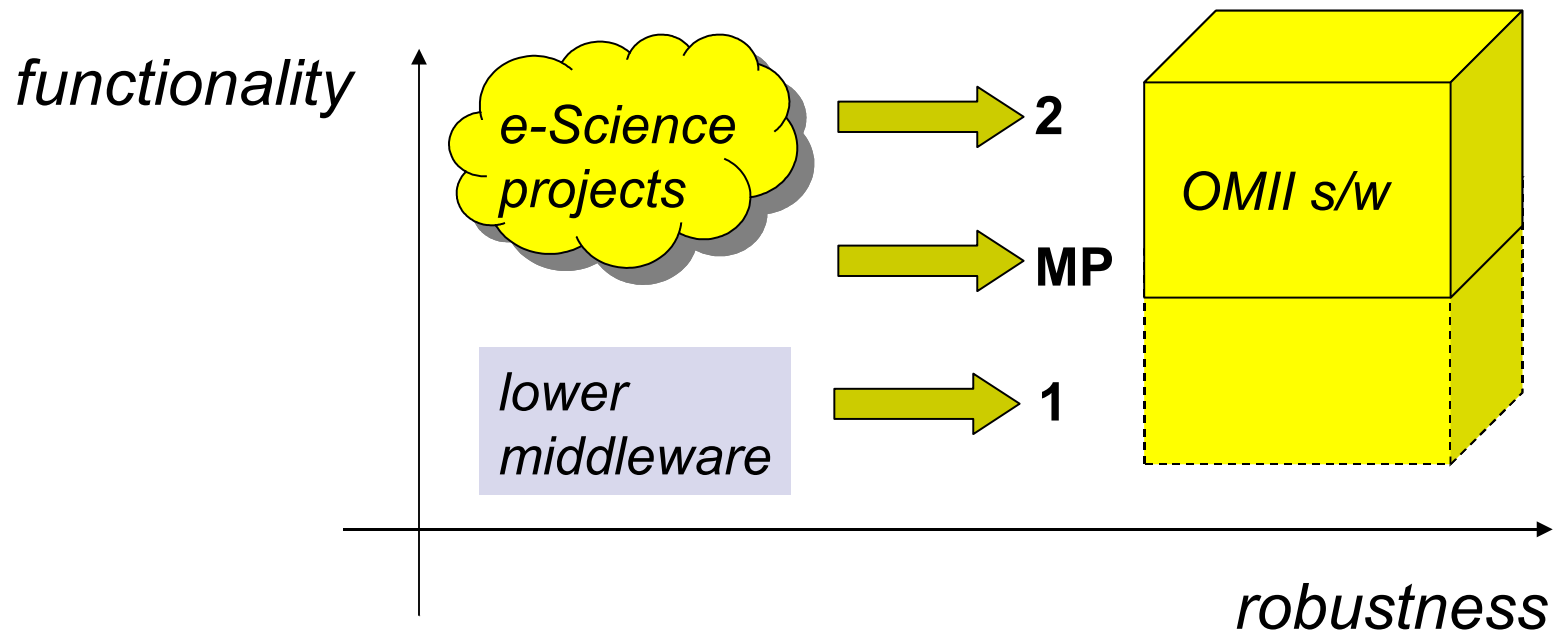
Value Propositions

1. Advanced e-infrastructure
2. Robust code



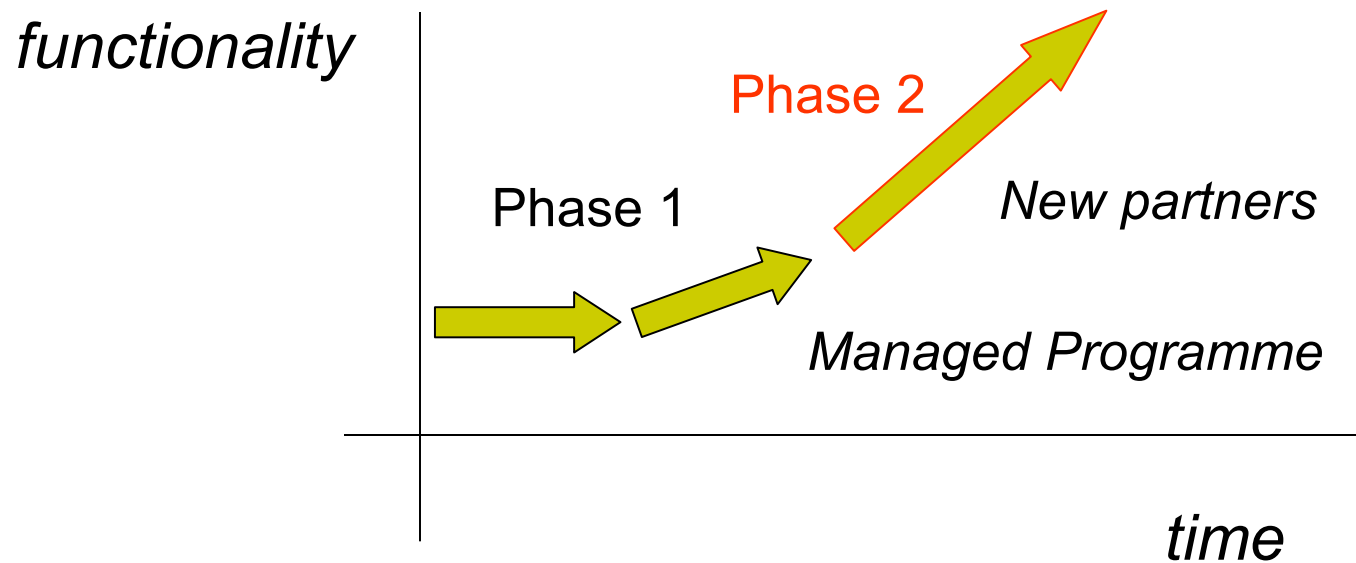
Value Propositions

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Value Propositions

1. Advanced e-infrastructure
2. Robust code





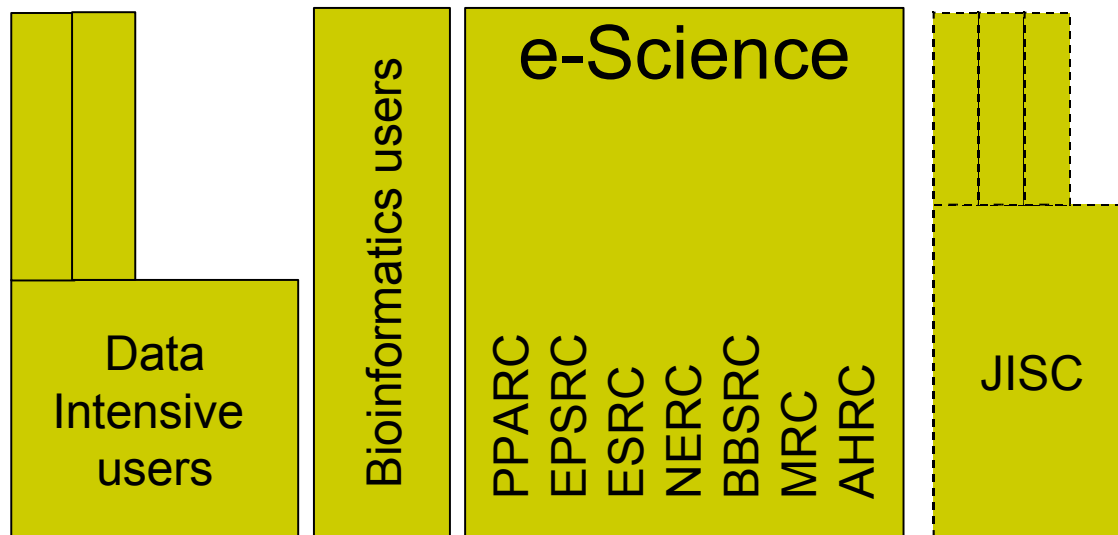
OMII Phase 1 Model



Robust e-Infrastructure capability and expertise

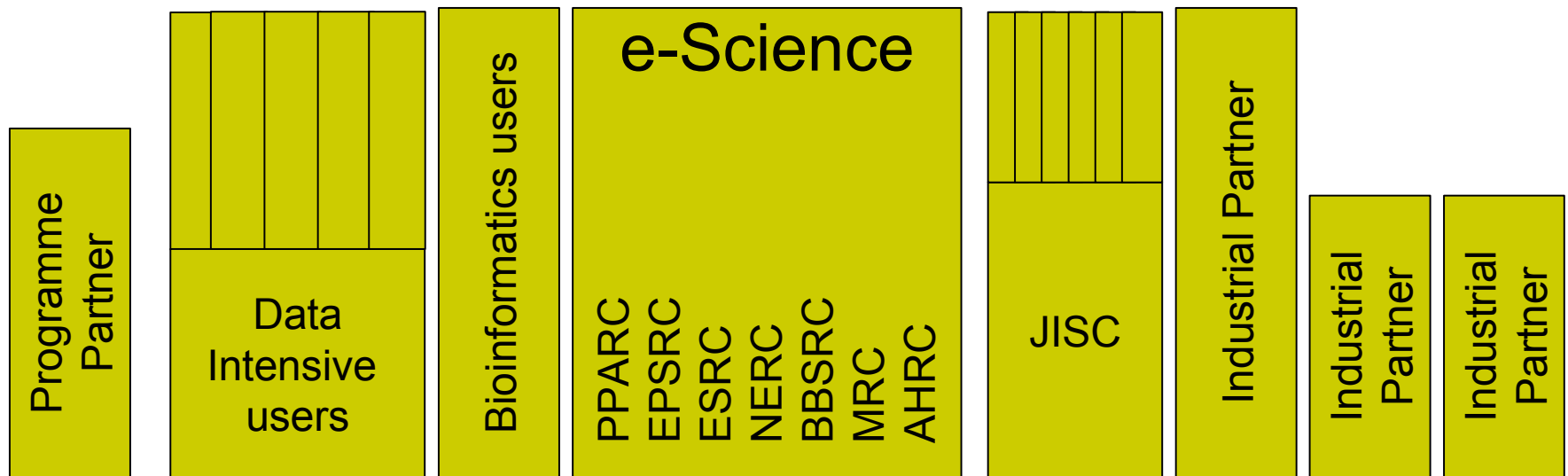
Industrial
Partner

Current OMII-UK Model

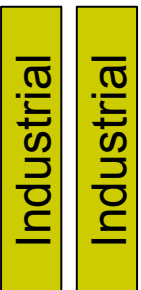


Robust e-Infrastructure capability and expertise

Sustainability through Partnerships

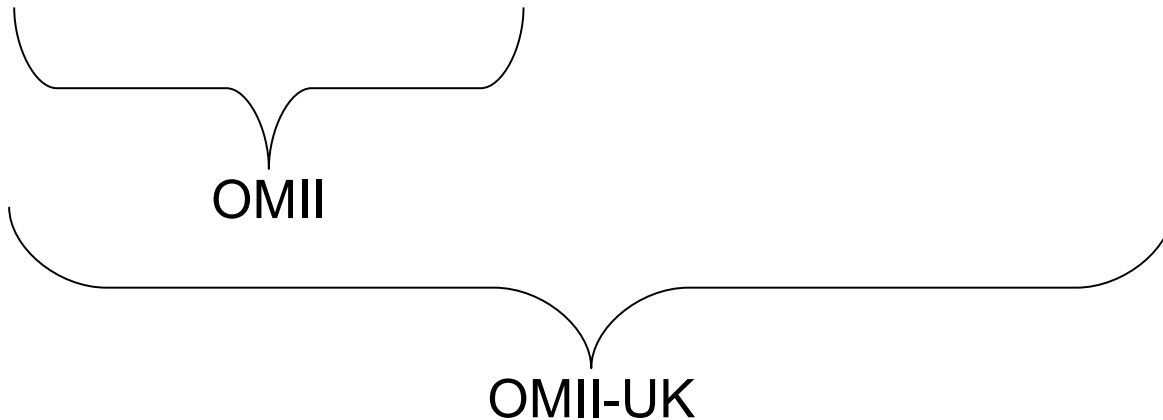
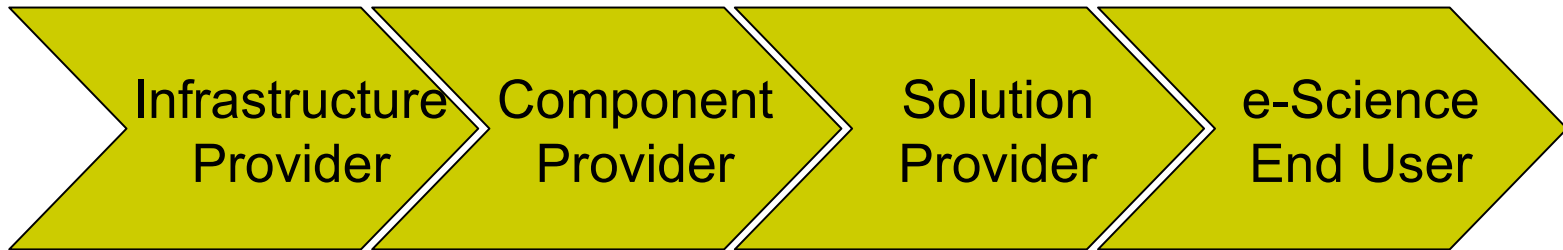


Robust e-Infrastructure capability and expertise





e-Science Value Chain





Vision

- OMII-UK will be the principal source for reliable, interoperable and open-source Grid middleware components, services and tools to support advanced Grid-enabled solutions in academia and industry
- Developers, infrastructure providers and end-users will all use OMII products
- OMII-UK will develop its business through partnerships and new investors to ensure sustainability



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How it Works



Objectives

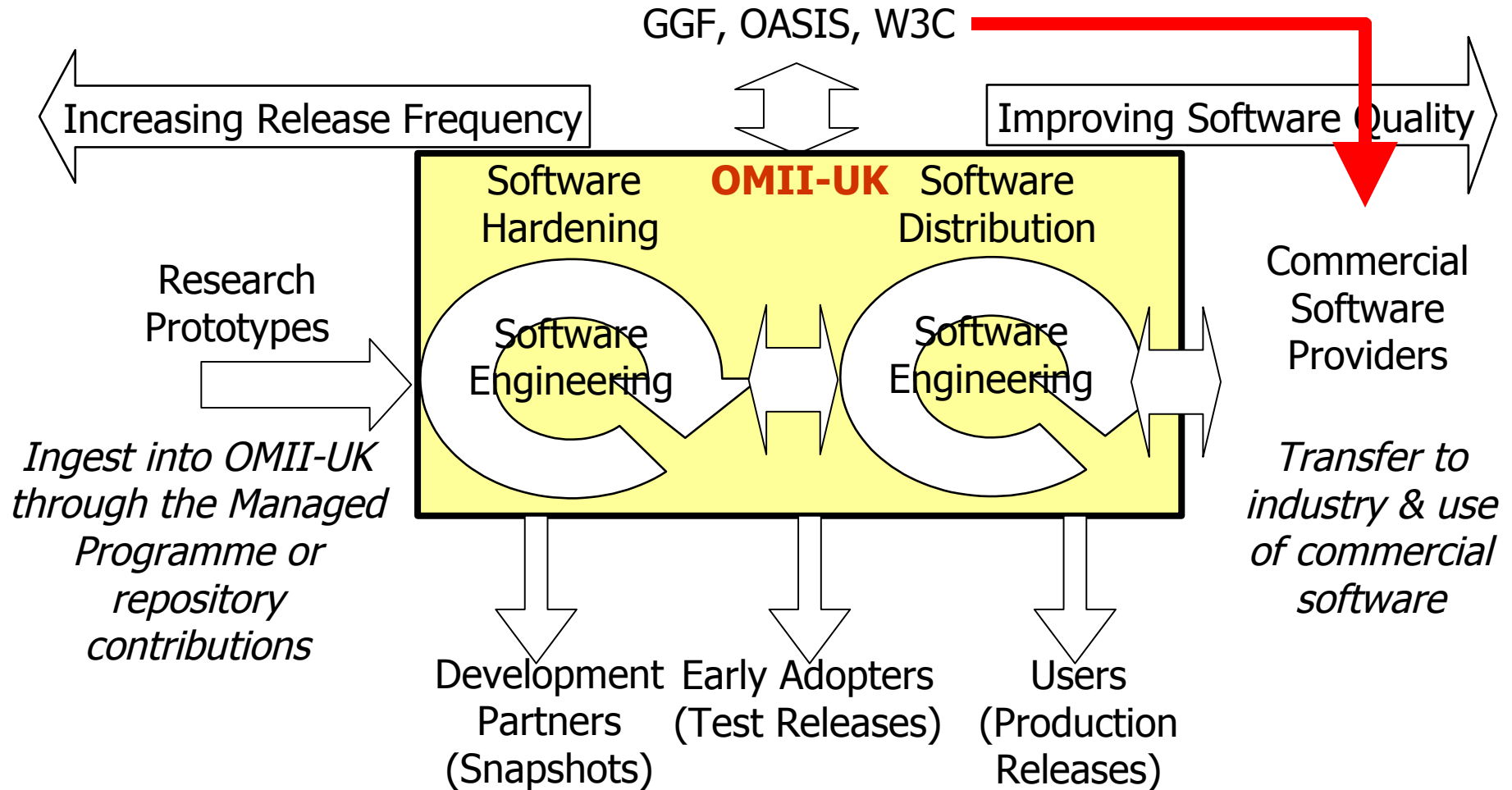
1. To distribute a sustained, well-engineered, interoperable, documented and supported set of easily-used integrated middleware services, components and tools
2. To engage proactively with user communities
3. To provide an industry-strength documented software engineering process
4. To maintain a leading international role in advanced e-Infrastructure middleware provision



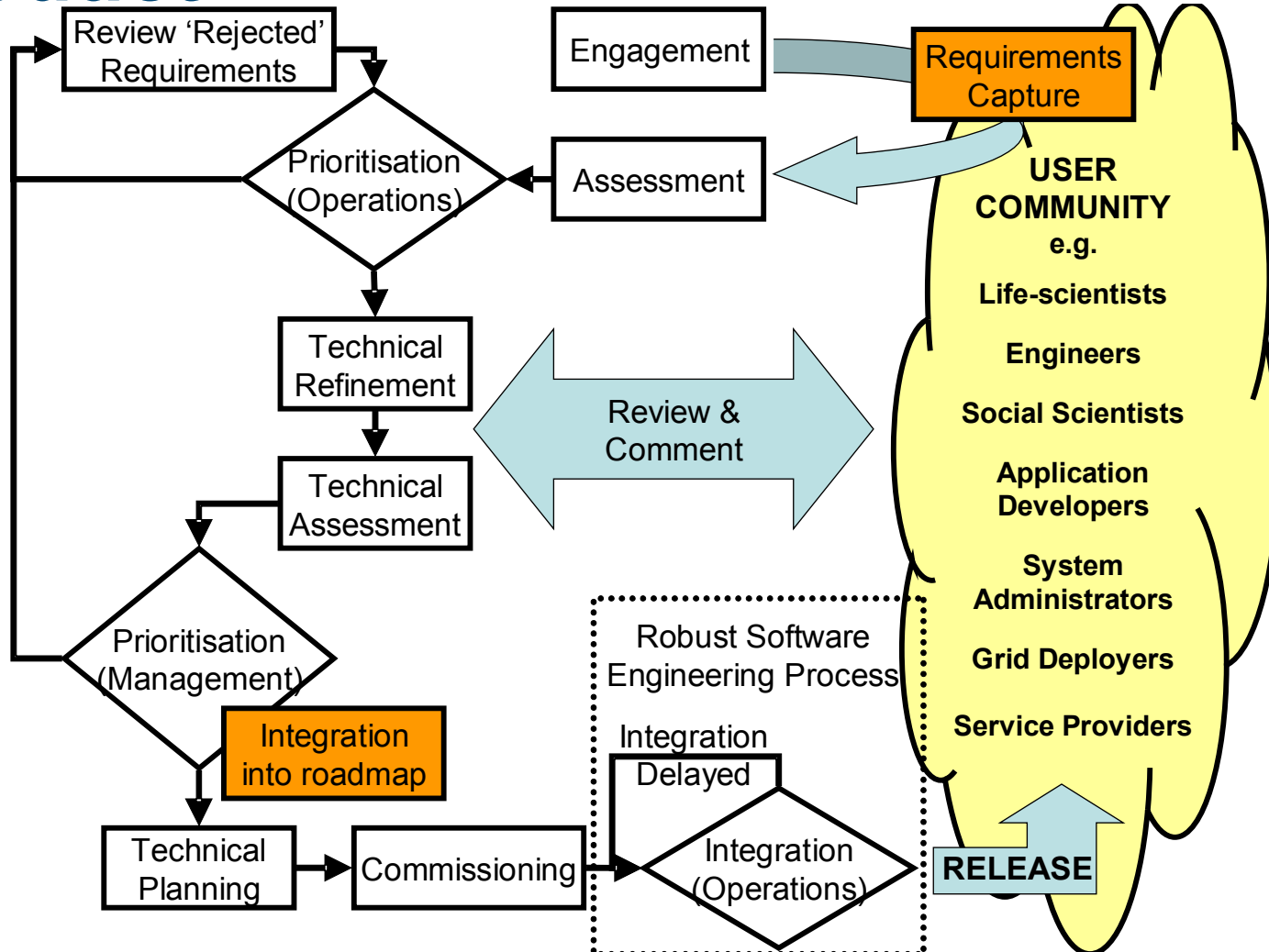
Activities

- User engagement
 - Forming partnerships with targeted user communities
- Sourcing
 - Working with UK and international service developers and middleware providers
- Software Engineering
 - Quality-assured software engineering, coordinated across OMII-UK partners and the managed programme
- Grid engagement
 - Tracking and engagement with the standards processes
- Sustainable business
 - Attracting partnerships and new investors

Linking Research and Commercial software solutions

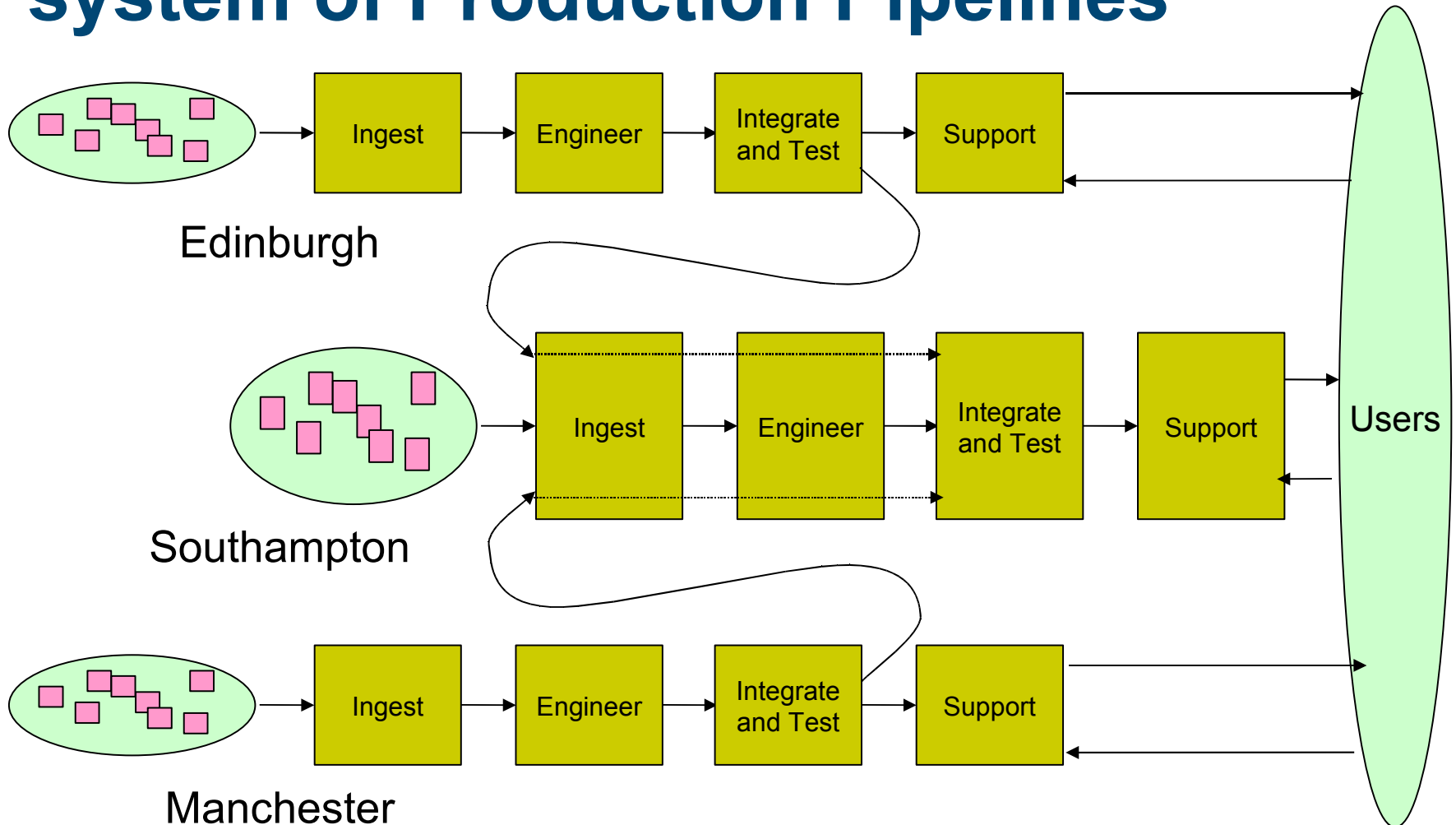


From User Requirements to Product

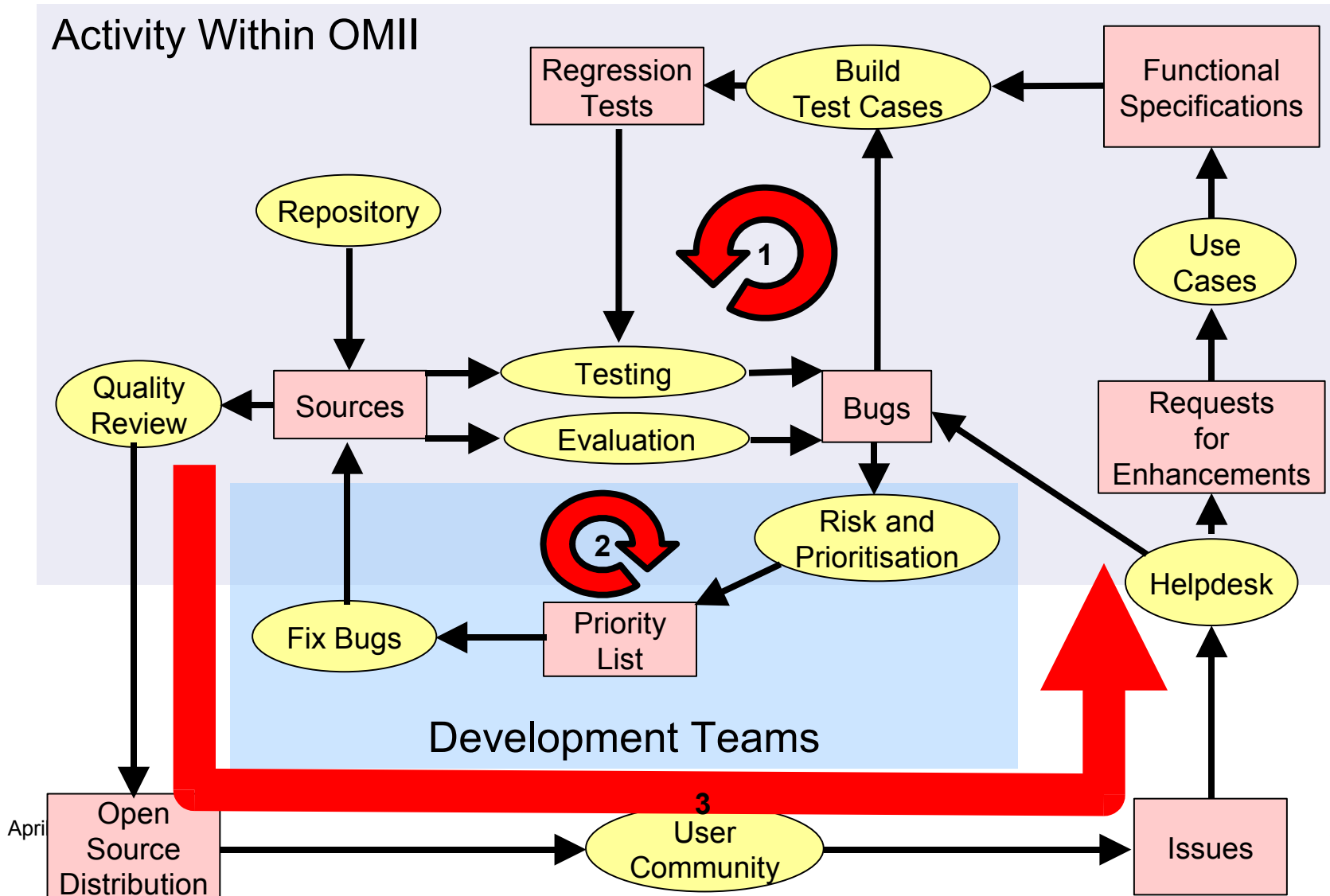




OMII-UK is a coordinated system of Production Pipelines



Robust Software Engineering Process





Robust SE Process

- Loop 1 – Testing
 - Evaluates incoming implementations against test cases generated from functional specs and discovers bugs
- Loop 2 – Development
 - Issues are prioritised and fixed, improvements are evaluated
- Loop 3 – Distribution
 - Integration into public distribution
 - Bugs and feature requests reported from community



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Managed Programme



Managed Programme

- Looking for mature research prototypes with demonstrated functionality and user community
- Will consider funding:
 - Re-engineering to improve performance & portability
 - Hardening to improve reliability & robustness
 - Documentation to improve usability and adoption
 - Use of OMII distribution as exemplar applications
 - Integration of software into the OMII distribution
 - Engineering support for engagement with standards bodies
- Will **not** fund research and 'blue-sky' coding



Initial Call

- Open call against a very broad roadmap
- Review led to 7 funded projects:
 - FINS (Notification)
 - FIRMS (Reliable Messaging)
 - GridSAM (Job Submission)
 - BPEL (Notification)
 - GRIMOIRES (Registry)
 - Geodise Lab (Matlab & Jython)
 - RAHWL (Robust Application Hosting WSRF::Lite)
- OGSA-DAI



OMII-UK Process

- Three funding avenues:
 - Responsive Mode: Unsolicited proposals
 - Letter of intent, feedback to full proposal
 - Calls: Open & Directed
 - To the community to provide specific technology
 - To a set of technology providers to propose solution
 - Contract:
 - Explicit sub-contract to fulfil defined technical need
- Use OMII-UK TAG as 'expert' group as required
- Projects managed through Community Interaction team

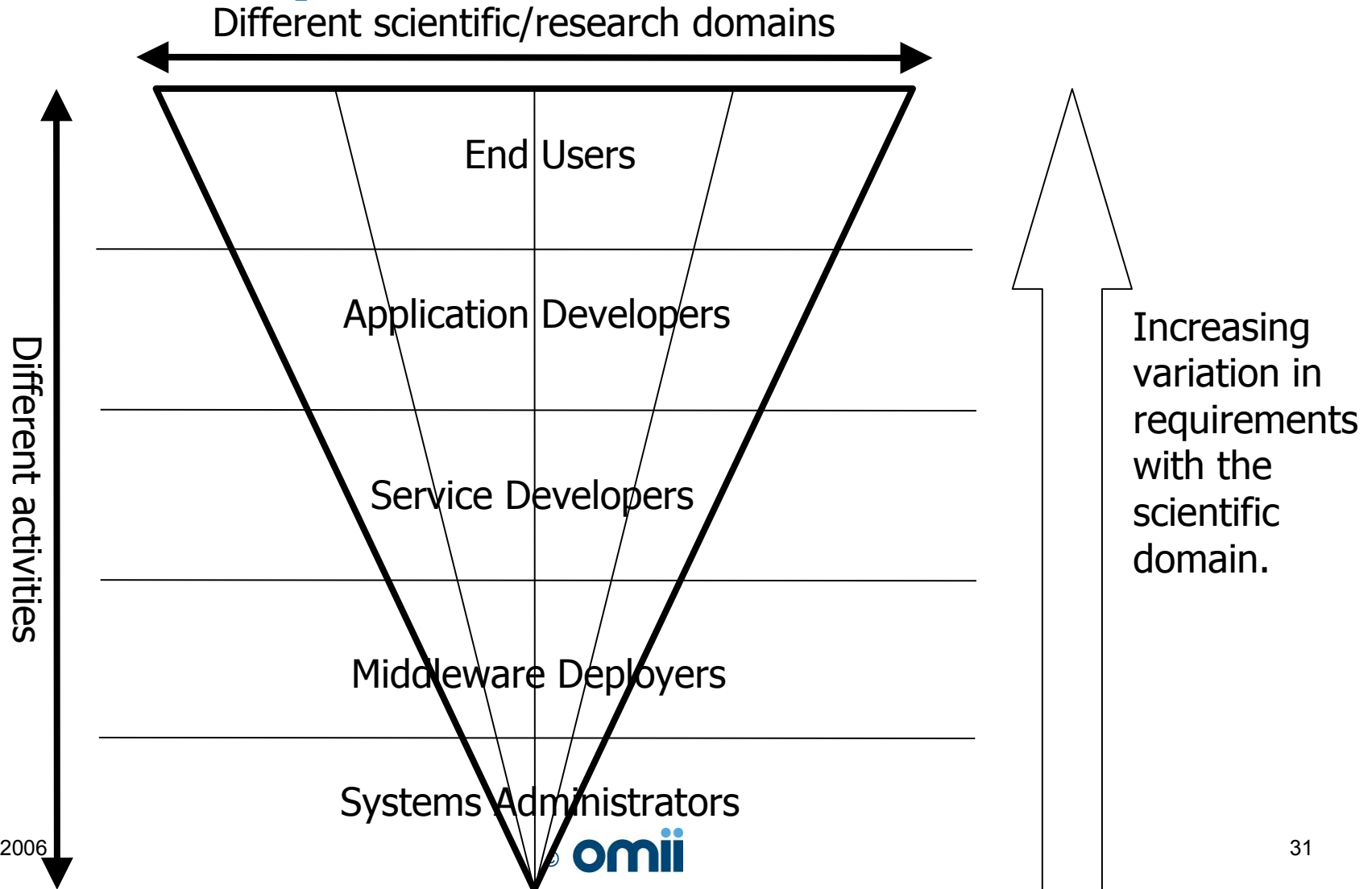


Collaboration: Infrastructure

- NMI based testing framework
 - Globus, Madison, ETICS (CERN)
- Container Requirements
 - Will need to move from Axis 1 'soon'
 - Assess requirements from OMII-UK and others
- Common Container Model
 - Make it easier to exchange software



User Requirements





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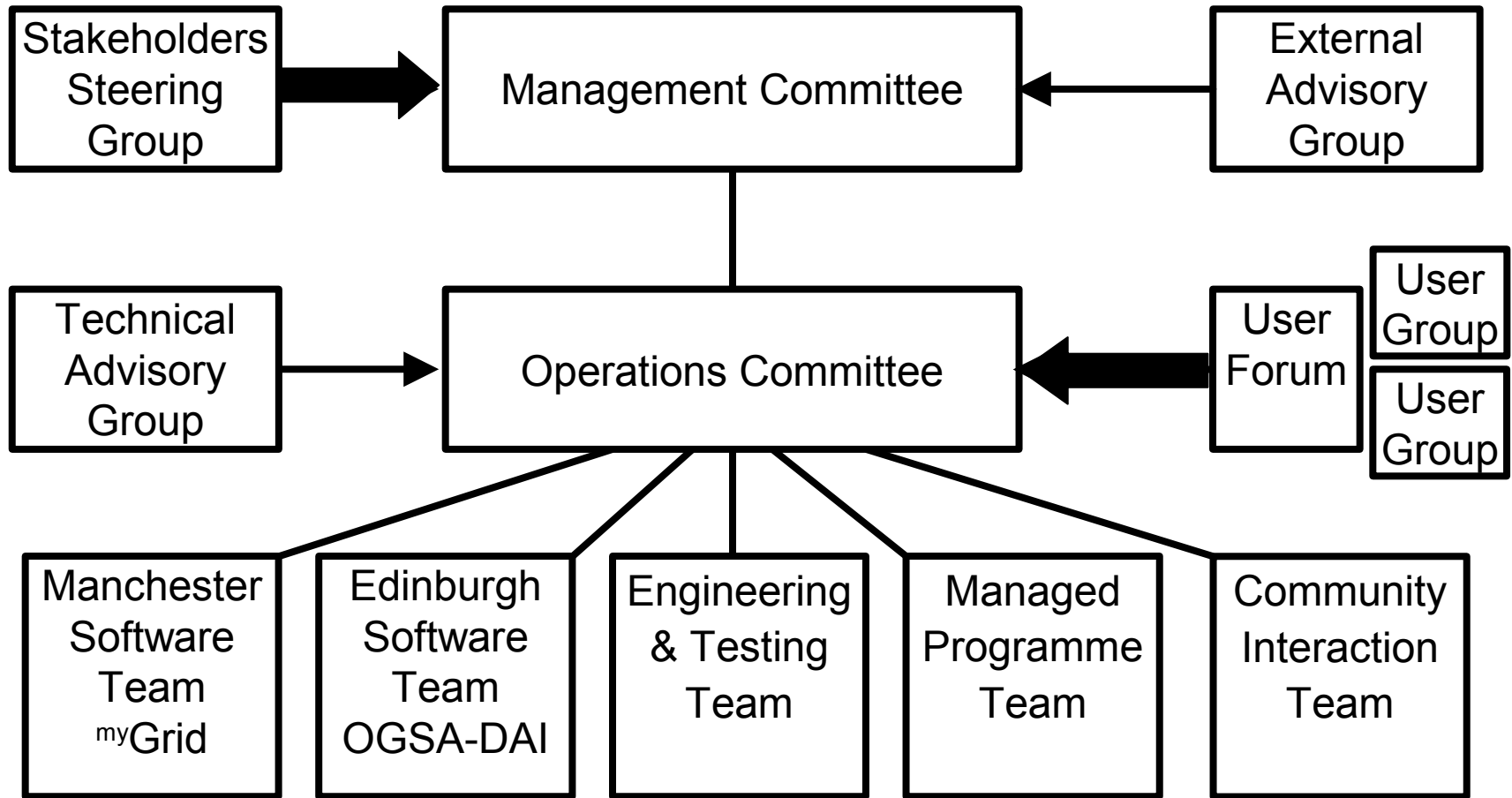
Governance



Observations

- OMII-UK is *not* a typical multisite research project
- OMII-UK is delivering services and products and needs to be organised accordingly
- OMII-UK involves over 40 employees across 3 sites, (50 across 10 including MP) interfacing with multiple external groups
- OMII-UK structure can learn from industrial organisational practice but must interpret this within the different operating context
- OMII-UK seeks further investors (funding agencies, industry and commerce) for sustainability

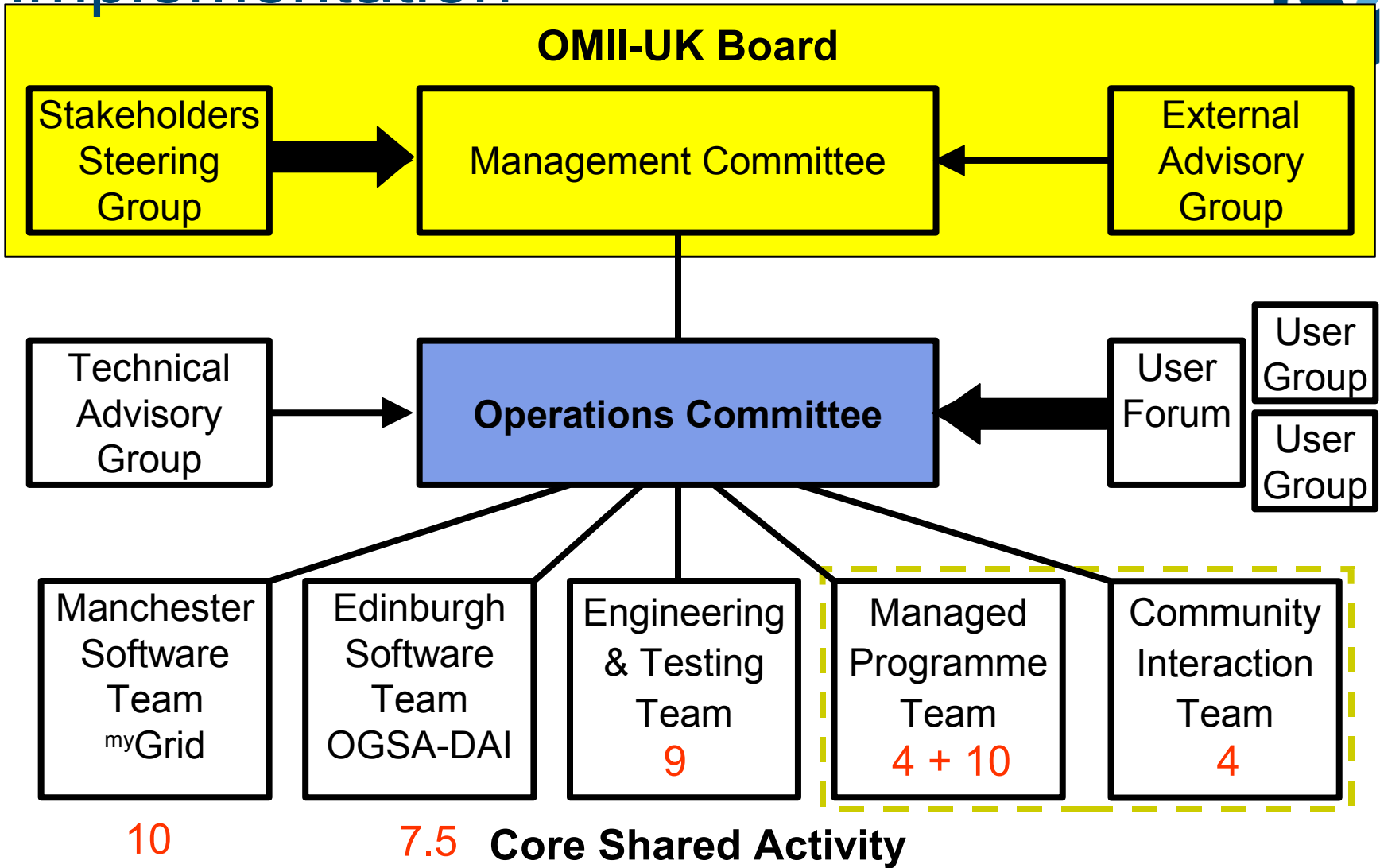
Functional picture (not a structure)



Core Shared Activity

User Support, Training, Test Infrastructure, Software Engineering, etc

Implementation



User Support, Training, Test Infrastructure, Software Engineering, etc



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Discussion Points



Discussion points

- Synergy of industrial software engineering process and open source community development?
- What about the e-Science code that isn't in our distribution?
- Towards a global middleware consortium?



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