

COVARM

course validation reference  
model

**Ref Models: Final Meeting**

**March 2006**

**“Everything should be as simple as possible,  
but no simpler”**

Albert Einstein

## **3<sup>rd</sup> TEST**

**India v England**

**4<sup>th</sup> Day: England          183-8**

**A lead of 302**

# Contents

- **COVARM Aims and Objectives**
- **Methodology**
- **Reference models and the role of UML**
- **Technical Results**
- **Next Steps**
- **(Business results)**

# What are the aims?

- **The COVARM project sets out to contribute a reference model for a “Course Validation” service to become a component of the JISC eFramework Programme.**

# What are the expected outputs

- **ELF Reference Model comprising**
  - Canonical business process model and information model
  - Specification and implementation of candidate services (J2EE)
  - Specification of required services
  - Proof of concept application using BPEL4WS

# And that means?

- **Understand the core business process**
  - Information flows, ordering, business rules, constraints
- **Represent the process in a computer readable form**
  - To provide guidance to others
  - Potential for automation of some or all
  - Provide sample automation for the identification of appropriate tools and systems

# Course validation as a business process

- **Characteristics**
  - Knowledge intensive
  - Expertise spread across multiple experts
  - Collaborative
  - Case based (each case may vary)
  - Primary “product”
  - External customers
- **Multiple stakeholders**

# Reference model principles

- **Support for different stakeholder perspectives**
- **Model driven - UML throughout**
- **Architectural perspectives from business process through to deployment**
- **Allow dependencies between different domains to be identified and specified**
- **Different levels of detail**

# Reference model architecture

	Stakeholder viewpoint	Functional Viewpoint	Security Viewpoint	Usability Viewpoint	Other Viewpoint...
Bus. Process Architecture		●			
Functional Architecture		●			
Technical Architecture		●			
Deployment Architecture		●			

Model Driven Architecture using UML

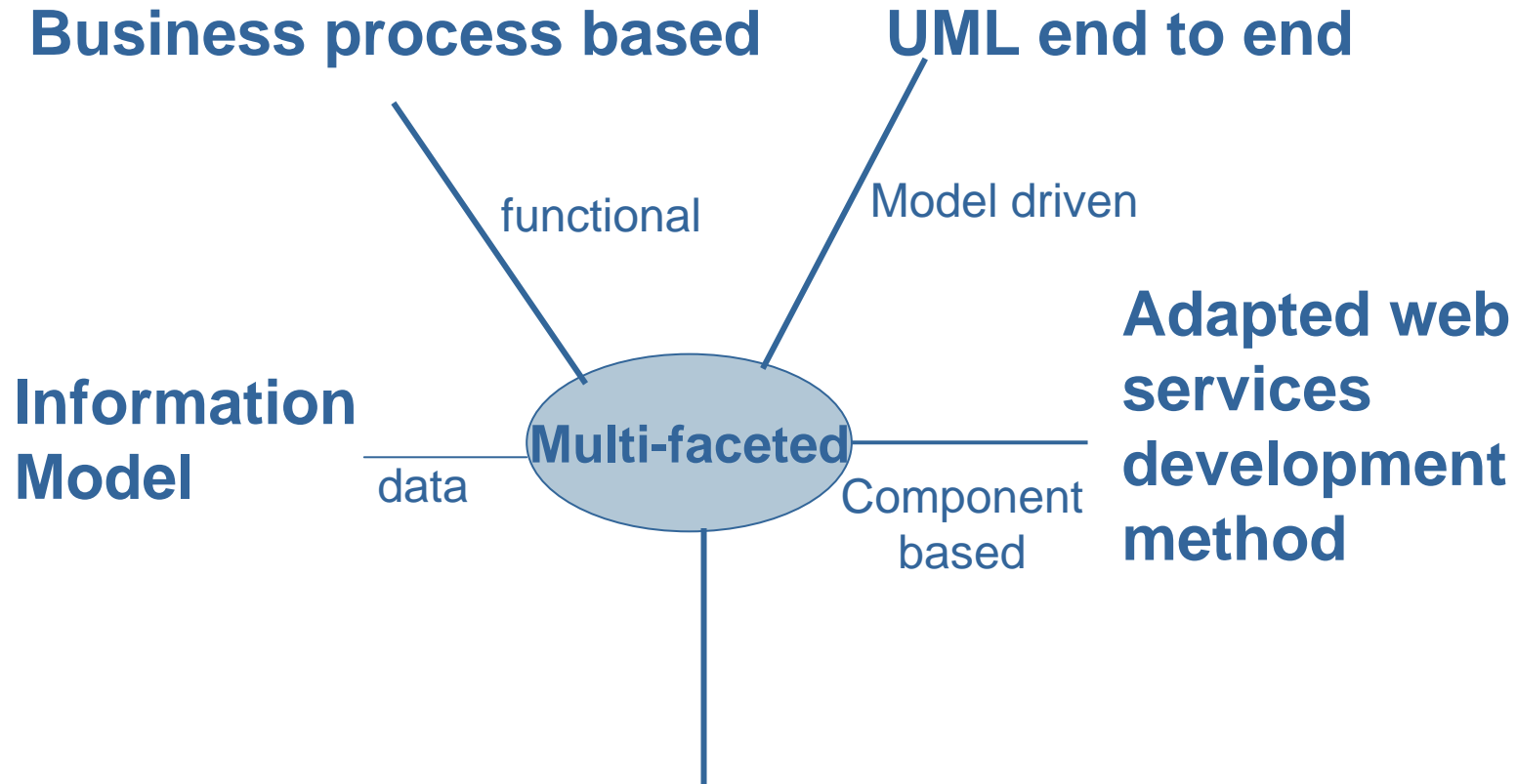
## Architectural Layer

**Our focus is on the Functional viewpoint**

**UML is used to model each cell at each architectural layer**

**Cells may require different subsets and extension of UML**

# Methodology



## Grounded Case Study Approach

- 4 case studies
- review by an independent HEI
- compare against survey results

# Current Results

## **Consistent with Reference Model principles**

- **Technical Developments**
- **Supporting developments**
- **(Business Perspectives)**
  - Not today's focus...
  - Available on website

# Technical outputs

- **Goal:**
  - From business process to automated business process
- **Technical issues**
  - “bleeding edge”
  - Lack of maturity of key technology – business process execution tools

# Scenarios

- **End to End process is large, complex and has multiple stop – start points (event entry points)**
- **Technical feasibility limited to developing sub-sections of the process - scenarios**

# Two scenarios explored in technical detail

## 1. Prepare programme proposal

- To get the initial approval to develop the new programme

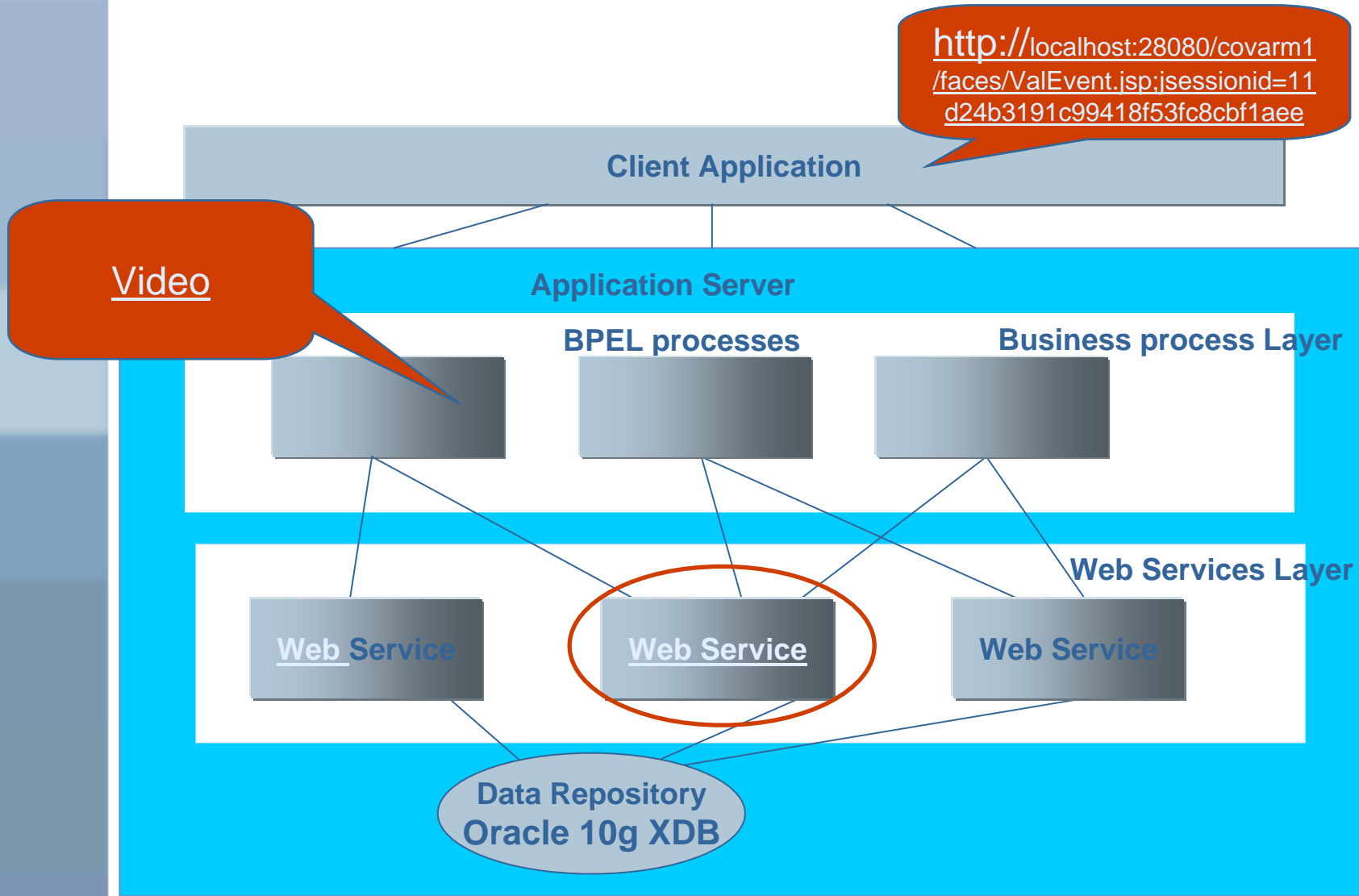
## 2. Run Validation Event

- To arrange the setting up of an event

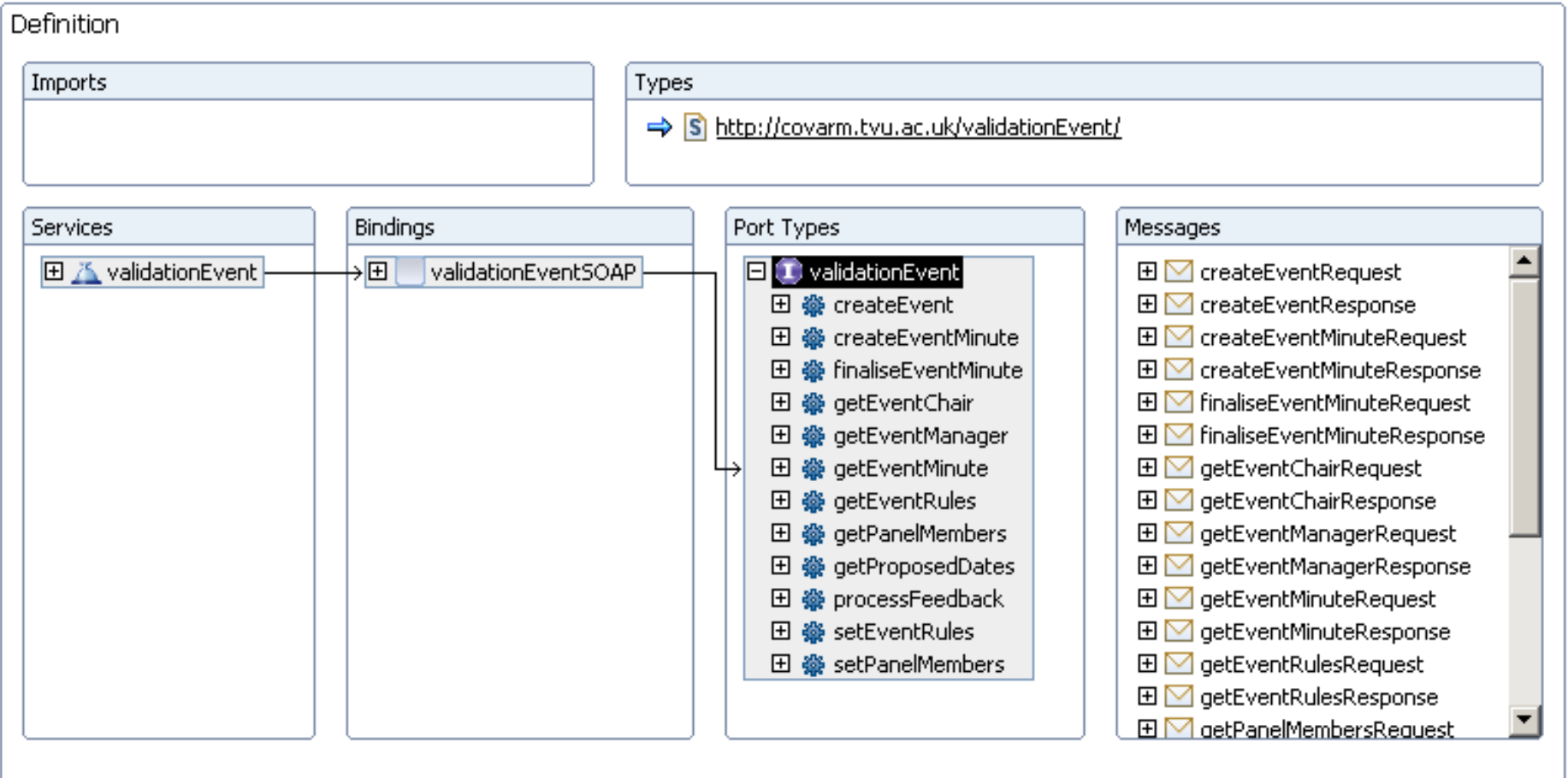
### • Scenarios chosen

- Breadth of coverage (stage 1 and 3)
- Multiple roles involved
- Core activities – common to all the institutions

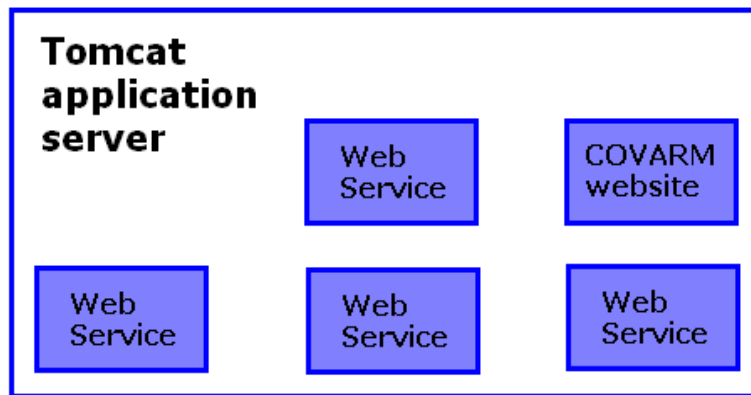
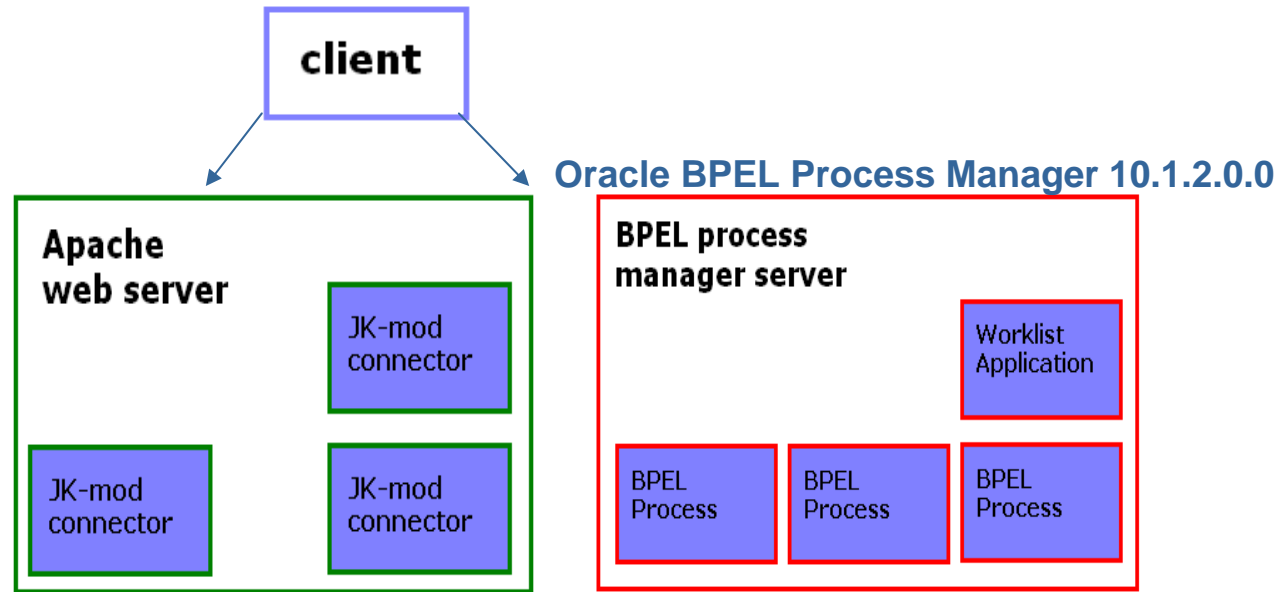
# Conceptual Architecture



# Validation Event Components



# Server Technical Architecture

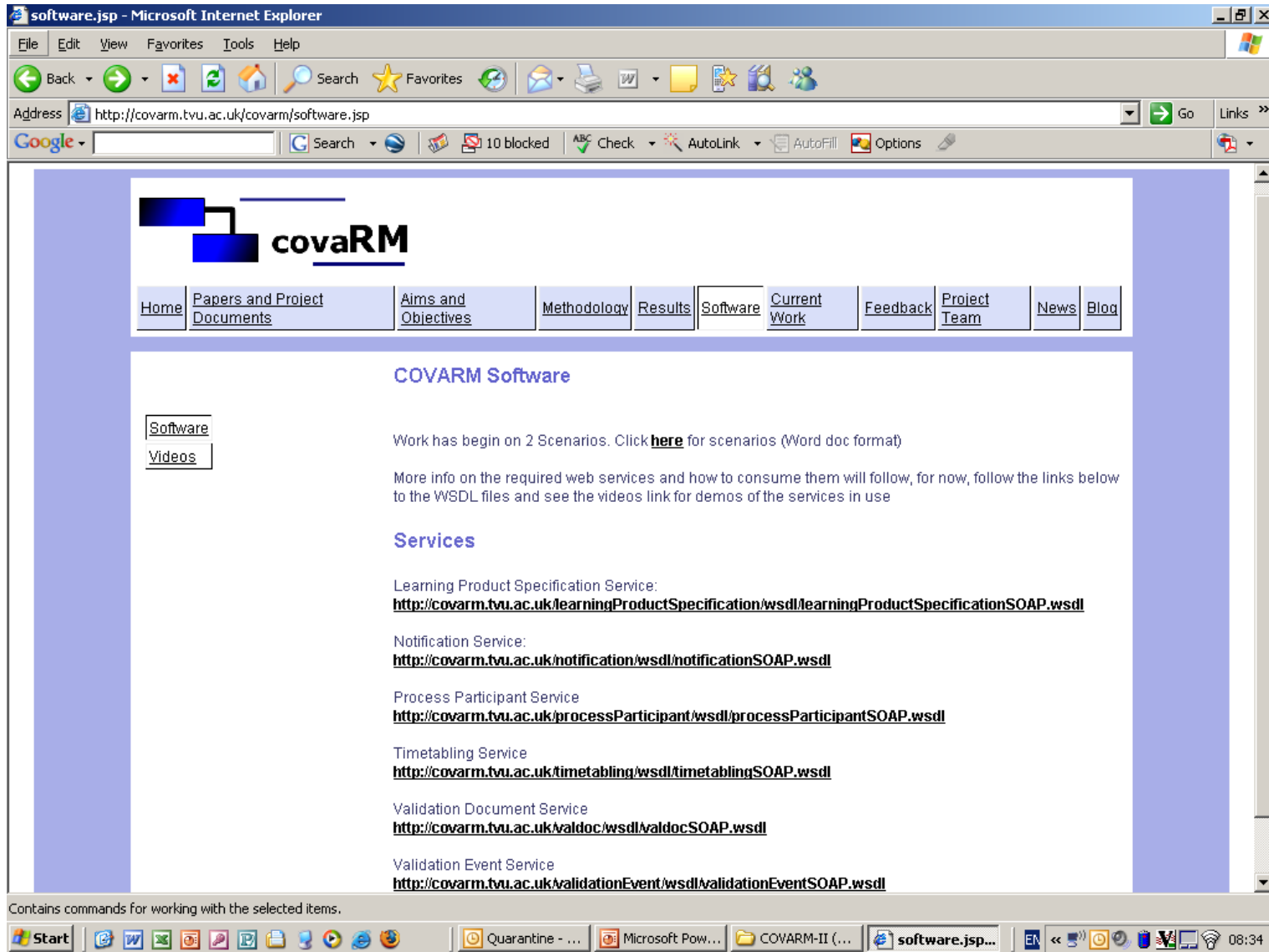


**Development Platform**

Java / WSDL development:  
 Rational Software Architect v6.0.1.  
 Some initial development on Eclipse WTP (Web Tools Platform) 1.0

BPEL development:  
 Oracle JDeveloper 10.1.2.0

# Software services developed




software.jsp - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Stop Taskbar

Address <http://covarm.tvu.ac.uk/covarm/software.jsp> Go Links >>

Google Search 10 blocked Check AutoLink AutoFill Options



Home Papers and Project Documents Aims and Objectives Methodology Results **Software** Current Work Feedback Project Team News Blog

### COVARM Software

[Software](#)  
[Videos](#)

Work has begin on 2 Scenarios. Click [here](#) for scenarios (Word doc format)

More info on the required web services and how to consume them will follow, for now, follow the links below to the WSDL files and see the videos link for demos of the services in use

### Services

Learning Product Specification Service:  
<http://covarm.tvu.ac.uk/learningProductSpecification/wsd/LearningProductSpecificationSOAP.wsdl>

Notification Service:  
<http://covarm.tvu.ac.uk/notification/wsd/notificationSOAP.wsdl>

Process Participant Service  
<http://covarm.tvu.ac.uk/processParticipant/wsd/processParticipantSOAP.wsdl>

Timetabling Service  
<http://covarm.tvu.ac.uk/timetabling/wsd/timetablingSOAP.wsdl>

Validation Document Service  
<http://covarm.tvu.ac.uk/valdoc/wsd/valdocSOAP.wsdl>

Validation Event Service  
<http://covarm.tvu.ac.uk/validationEvent/wsd/validationEventSOAP.wsdl>

Contains commands for working with the selected items.

Start Quarantine - ... Microsoft Pow... COVARM-II (... software.jsp... EN 08:34

# Technical Issues

- **UML Modelling tool maturity**
  - IBM Rational XDE for business modelling
  - IBM Rational Architect for Technical development
  - Support for UML 2.0;
  - Usage of tools to support MDA needs careful thought in structuring of models
  - Model pollution
  - SOA tools more focused on SOA for legacy re-use and enterprise application integration rather than new development
- **BPEL Modelling Toolsets**
  - BPEL<>WSDL Links: Problems with complex data types in message flows
    - Have to break down complex types into simple types on message flows
    - Work arounds available
- **WSDL to Code generation**
  - New methods added to wsdl require full re-generation of code leading to cut and paste of old business logic.
  - Paper in preparation on this.

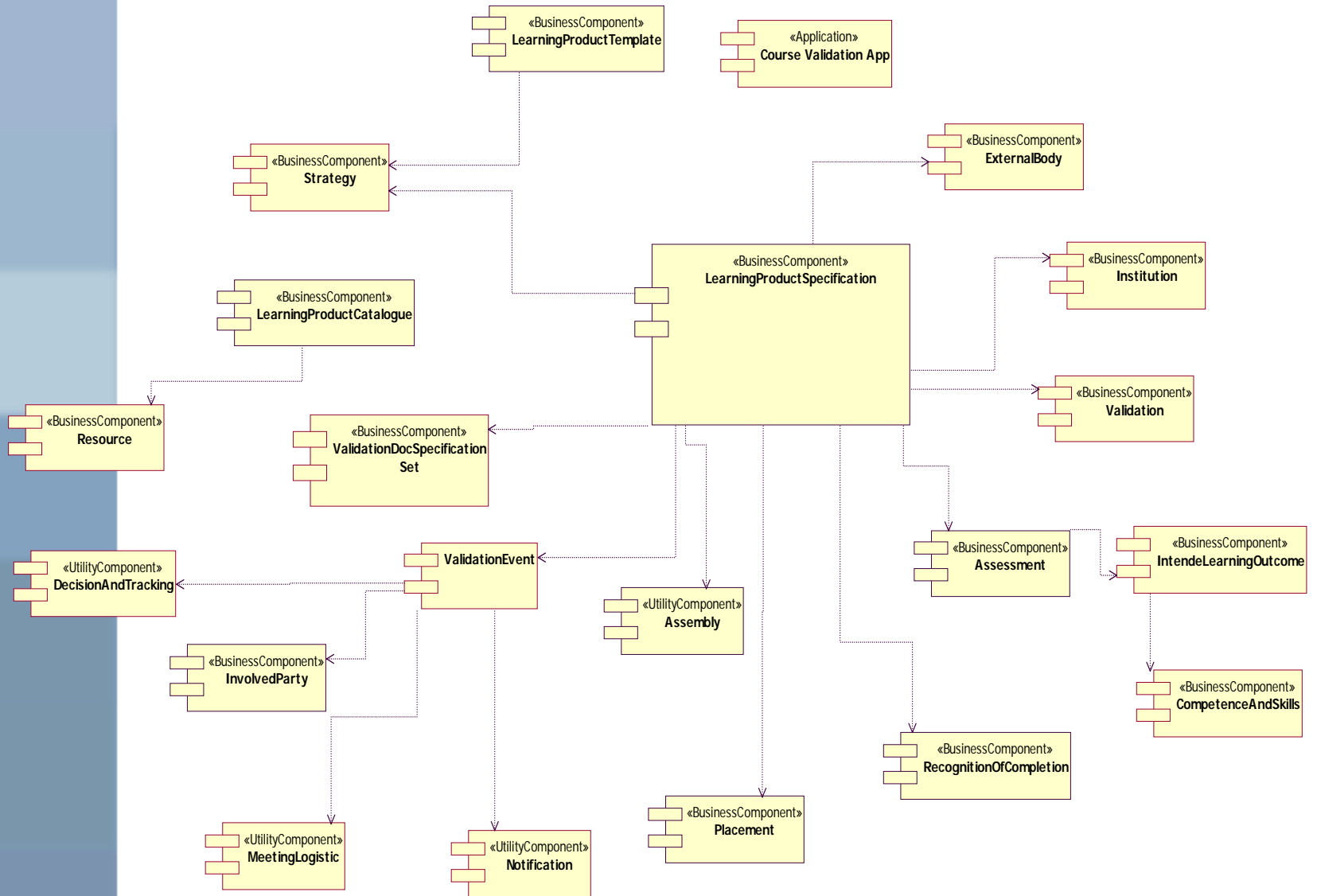
# Other results

- **Collaborative working with other JISC projects**
  - XCRI, SUNIWE, P4P
  - Development of a unified information model
- **Development method for service oriented development**
  - Useful approach – not formalised yet – paper planned
- **“Reference Modelling” experience for JISC**
  - Workshops for UML

# Collaboration with other JISC projects

- **eFramework requires a joined up approach**
- **XCRI, P4P, SUNIWE**
  - Requirements on course information
  - COVARM is the defining source of that information
- **Production of an “enterprise” information model for this area**
- **Used to produce candidate component specifications / services**
  - Some have been implemented in this phase

# Candidate Services



# Implications

- **Formal documentation of best practice**
  - greater opportunities for business transformation (c.f. wider industry best practice)
  - Automation of part or all is possible
  - More informed collaboration with vendors (content management, CRM)
  - Off the shelf validation processes
  - Inter-institution course design
  - Easier to identify issues, areas for improvement, best practice
- **Reference models**
  - Better support for bench marking;
  - Comparative analysis
  - Documentation of business rules
  - Better support for quality assurance and evaluation
  - Manage dependencies between domains in the e-framework

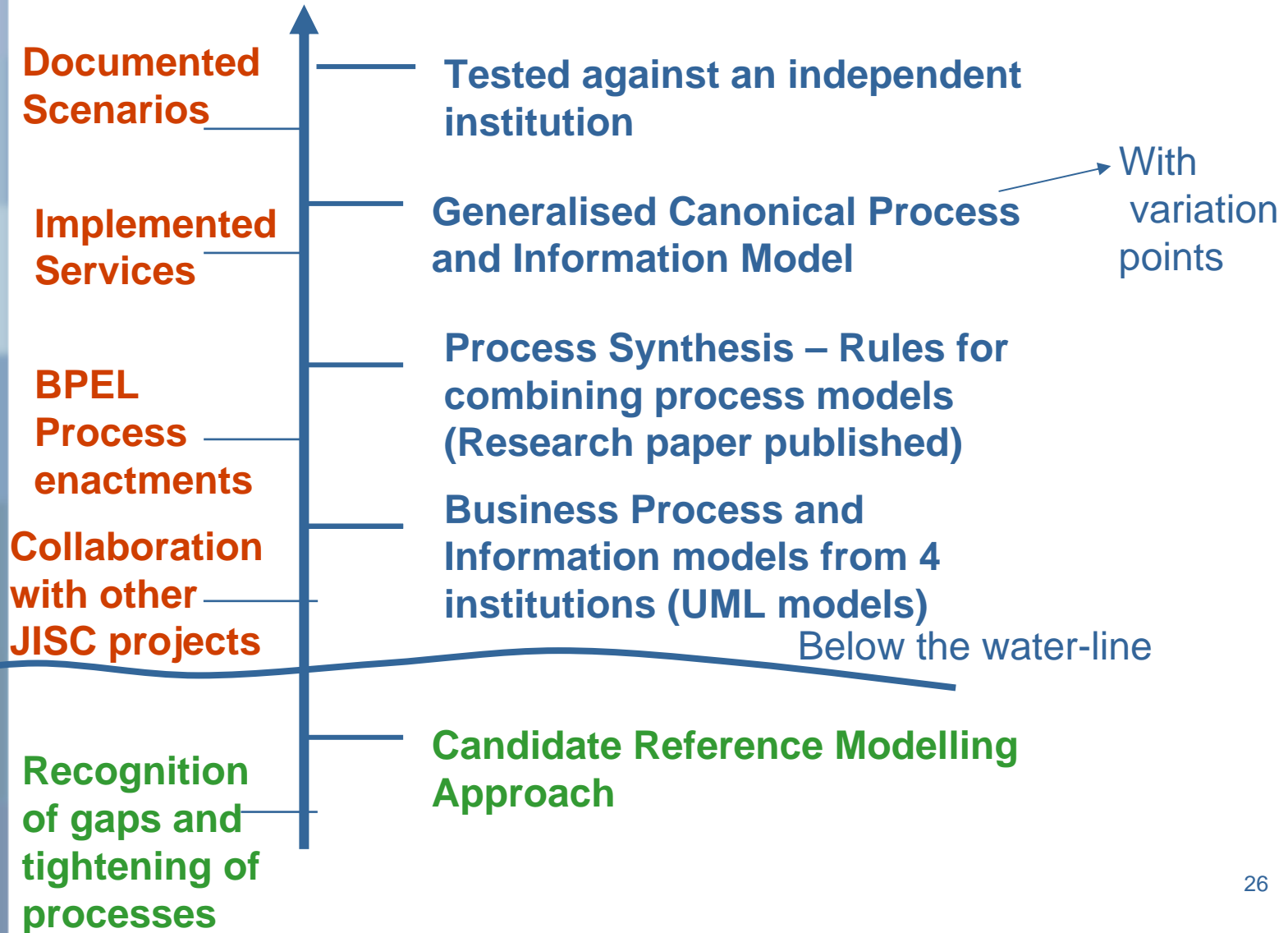
# COVARM II Objectives

- **Workflow Application**
  - Utilising existing and new services
  - RIA technology (linkage from rich interactive technology to BPEL API)
- **New Services to support specific requirements**
- **COVARM\_PDK**
  - Sample content for methodology, process and service oriented architecture for E-frameworks
- **Promote a community of practice around automated course validation**
  - Include vendors;
  - Widening out of BPM principles to other areas in the enterprise
  - Support academic analytics

# Embedding

- **Stakeholders identified requirements to support:**
  - Validation event management
  - Configuration control of validated programmes and modules and their evolution
- **Initial agreement for TVU to use the COVARM II application**
- **Other institutions in discussion**

# Outputs Summary



# What are the expected outputs

- **ELF Reference Model comprising**



- Canonical business process model and information model



- Specification and implementation of candidate services (J2EE)



- Specification of required services
- Proof of concept application using BPEL4WS

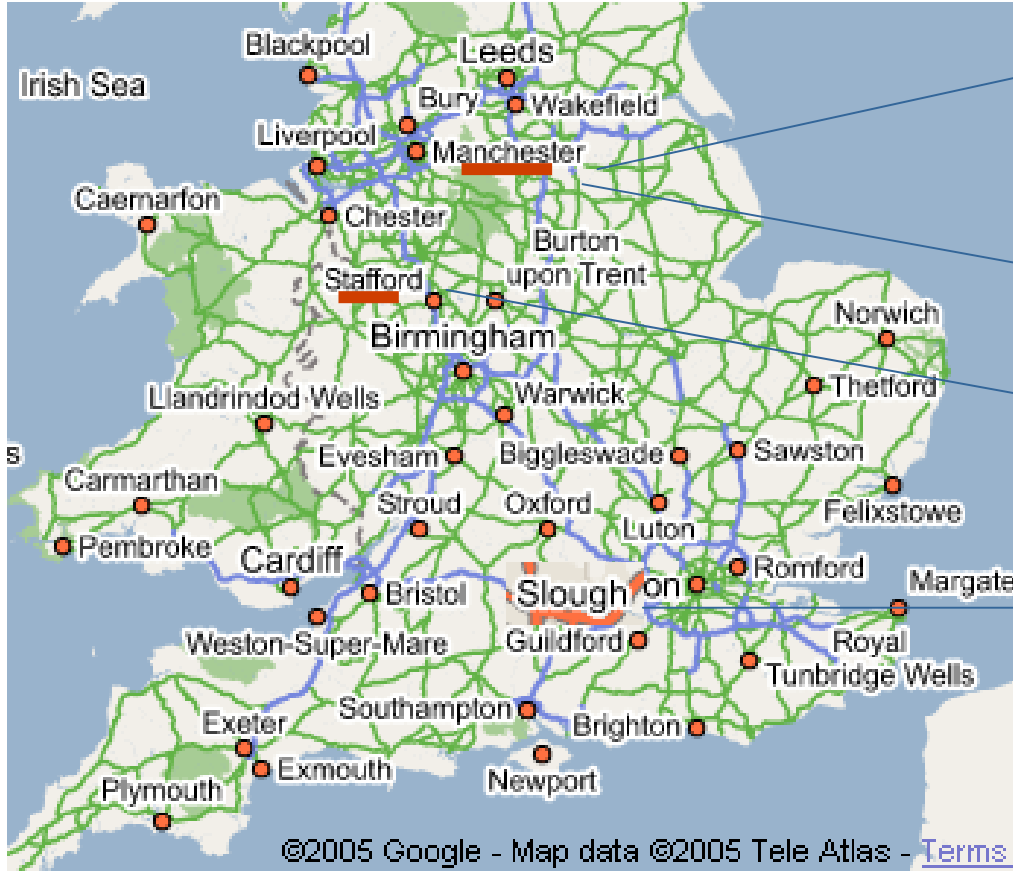
# Questions?



<http://covarm.tvu.ac.uk/covarm>

Email: [bbarn@acm.org](mailto:bbarn@acm.org)

# Who are the collaborators

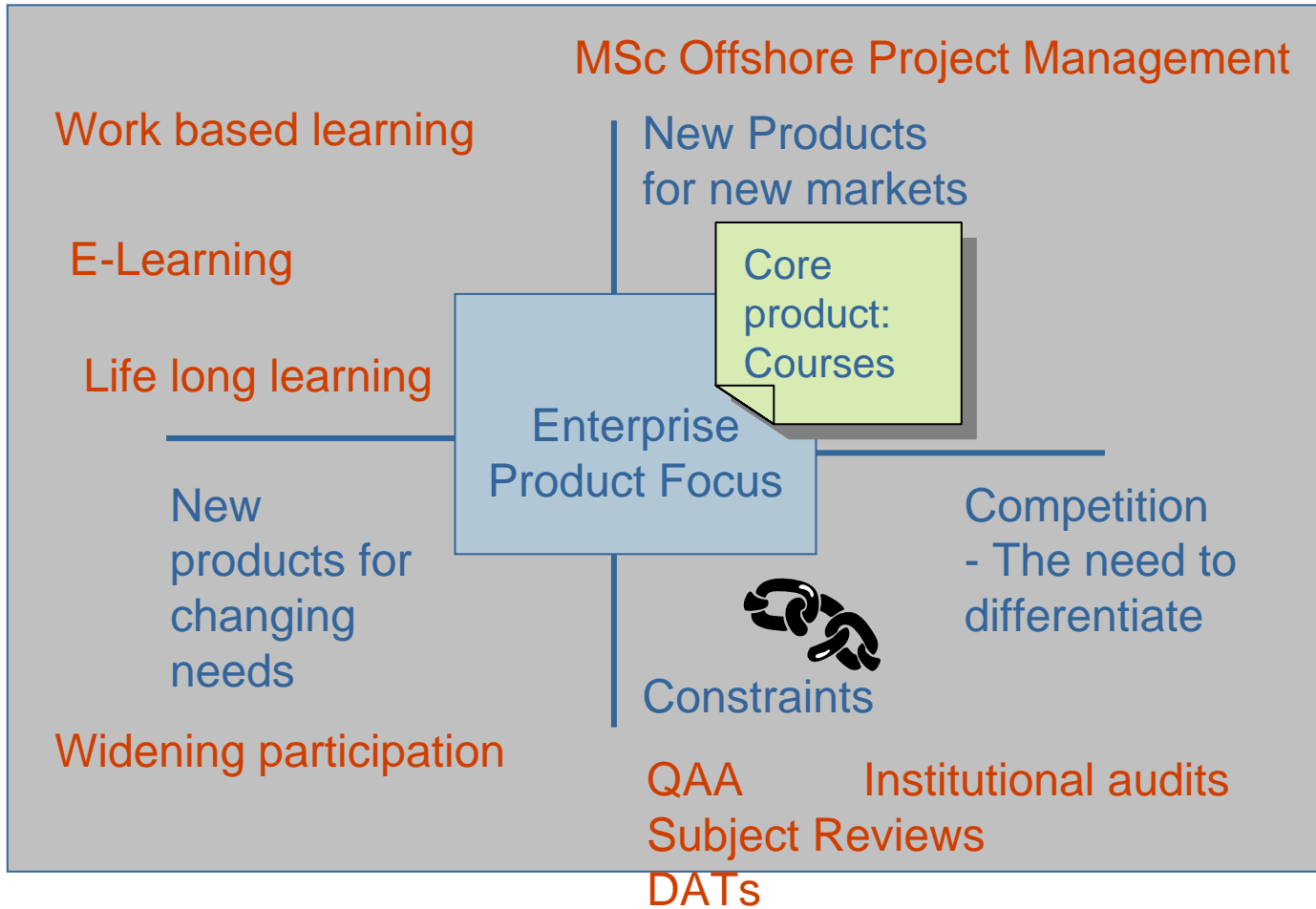


- University of Manchester
  - ELearning
  - Enterprise Modelling
- Manchester Metropolitan University
  - XCRI project
- Staffordshire University
  - SUNIWE
  - QA
- Thames Valley University
  - Project management
  - Technical development
  - Enterprise Modelling

# Project Team

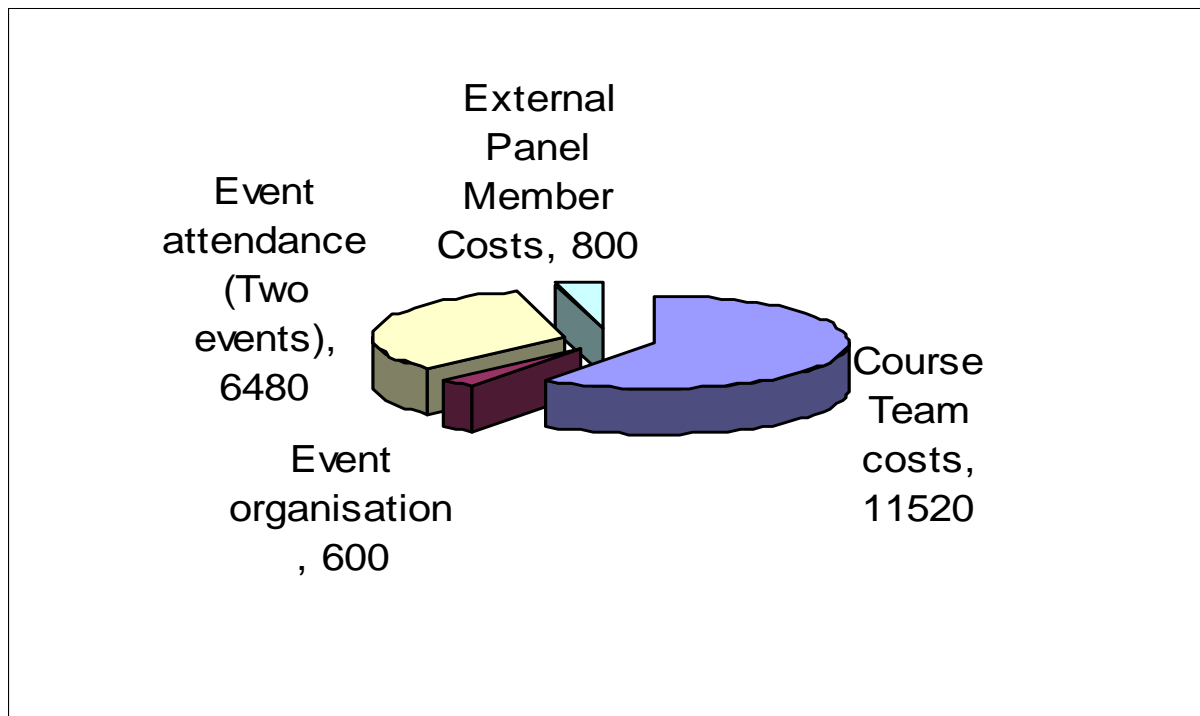
- **Thames Valley University**
  - Balbir Barn (Project Lead)
  - Samia Oussena (Tech Lead)
  - Dan Sparks (Development)
- **University of Manchester**
  - Hilary Dexter (Process modelling lead)
  - Jim Petch
- **Staffordshire University**
  - Mark Stiles
- **Manchester Metropolitan University**
  - Mark Stubbs

# What's the problem... and the context?



A major challenge is to design and develop courses for new markets, in constant change, and to appropriate quality and standards

# new course products are important... but



## Health Check



Based on data from case study  
We are still collecting actual costs

There are 30-35 course validations per year = **679000**

50 or so institutions could be repeating this... = **33,950,000**

so let's automate...



**Even a partial automation and system support will deliver REAL benefits**

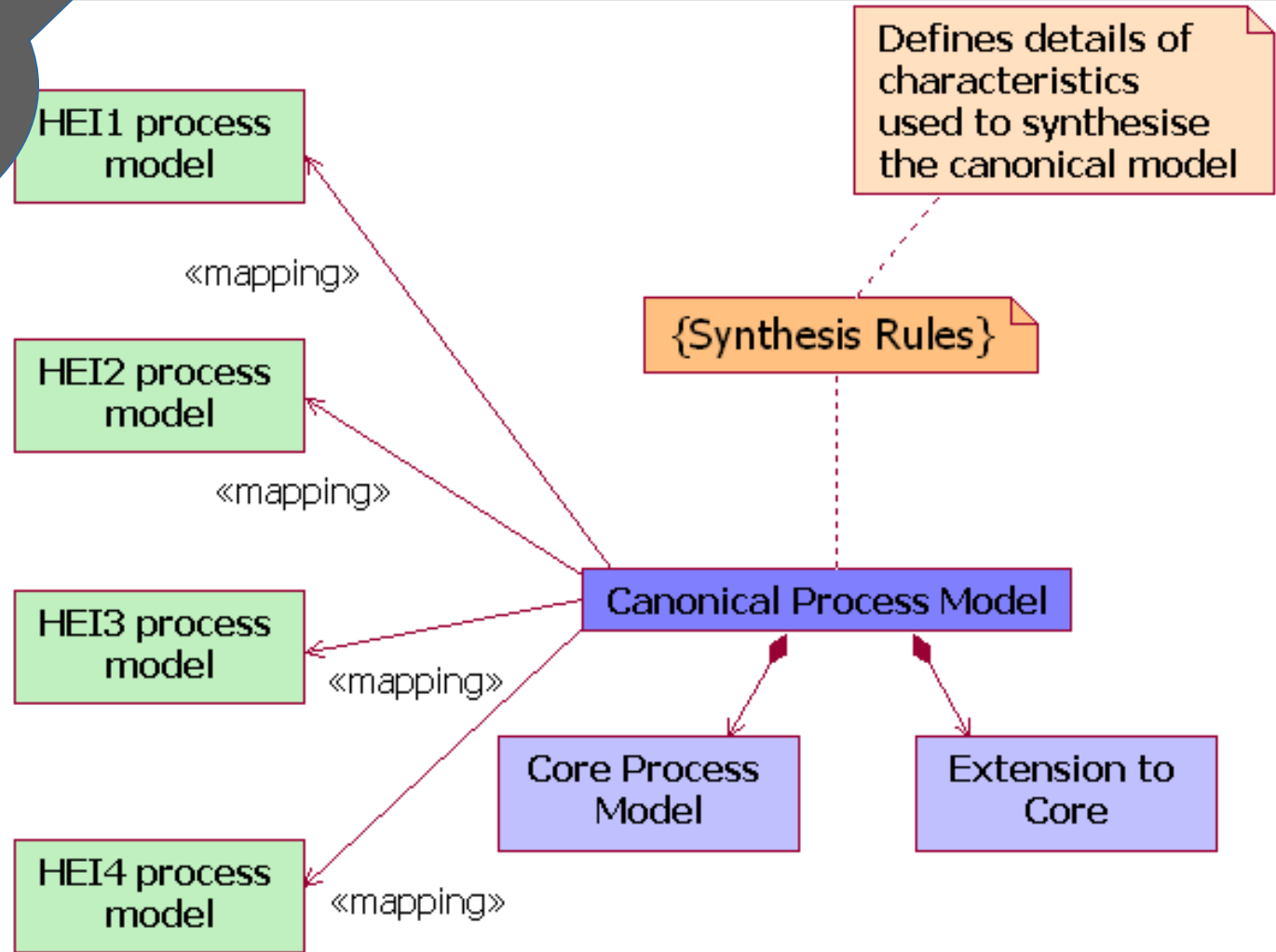
# Business view

- **Capturing of as is models (4 sites)**
  - Process, information, business rules, constraints
- **Process synthesis**
  - Process patterns, variation points
- **Canonical model**
  - Synthesis not re-engineering
  - Test against an independent org
- **Good level of comfort with models**
- **Observations on own processes**
  - Areas of good practice – learning from others
  - Identification of issues
  - Coverage
  - Complexity (org units, activities, decision points)
- **business rules**
  - composition of panels
  - time constraints
  - cost models
  - decisions and outcomes of validation events
  - E-learning requirements / thresholds

# The key challenges?

- process synthesis

**Synthesis and not Re-engineering**



# Synthesis results

- <http://covarm.tvu.ac.uk/Covarm>

<http://covarm.tvu.ac.uk/covarm>