EVENTOS | 2008

VIII WORKSHOP REBIUN PROYECTOS DIGITALES. PRESERVACIÓN DIGITAL

PLANETS: PRESERVATION AND LONG-TERM ACCESS THROUGH NETWORKED SERVICES

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Red de Bibliotecas REBIUN

Planets:
Preservation and Long-Term Access through Networked Services

VIII Workshop REBIUN sobre Proyectos Digitales
"La Preservación Digital : Memoria de Futuro"
Murcia, October 2008

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partially based on slides by Adam Farquhar, Planets project lead

Why do we need Digital Preservation?

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Why do we need Digital Preservation?

- Digital Objects require specific environment to be accessible :
  - Files need specific programs
  - Programs need specific operating systems (-versions)
  - Operating systems need specific hardware components
- SW/HW environment is not stable:
  - Files cannot be opened anymore
  - Embedded objects are no longer accessible/linked
  - Programs won‘t run
  - Information in digital form is lost
    (usually total loss, no degradation)
- Digital Preservation aims at maintaining digital objects authentically usable and accessible for long time periods.

The Longevity of Digital Objects

- Digital objects are the dominant way we exchange information
- Digital objects need technical environment to “function”
- Environments change
- Heterogeneity and complexity of file formats and speed of technological change make long-term access a challenge
- Digital preservation: Long-term access to digital objects
- Dominant types of preservation actions:
  - Migration
  - Emulation

Agenda

- Introduction to Planets
  - Who are we?
  - What are we doing?
  - Why are we doing it?
- The Planets architecture and components
- Preservation Planning in Planets
- Progress and next steps

The Planets project

- Addresses core digital preservation challenges
- Builds on strong digital archiving and preservation programmes
- 4-year research and technology development project co-funded by the European Union
- Started June 2006 with €15m budget
- Coordinated by the British Library
- 16 library, archive, research, technology partners

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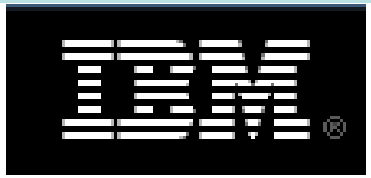
- Address core digital preservation challenges
- Started June 2006 with €15m budget
- Coordinated by the British Library
- 16 partners
  - national libraries and archives
  - leading technology companies
  - research universities
- Builds on strong digital archiving and preservation programmes

Planets partners

- The British Library
- National Library, Netherlands
- Austrian National Library
- State and University Library, Denmark
- Royal Library, Denmark

- National Archives, UK
- Swiss Federal Archives
- National Archives, Netherlands

Planets partners



- Tessella Plc
- IBM Netherlands
- Microsoft Research
- Austrian Research Centers GmbH

- Hatii at University of Glasgow
- University of Freiburg
- Vienna University of Technology
- University of Cologne

The Planets team

All Staff Meeting, February 2007

Planets goal

Build practical services and tools offering national libraries and archives an increased ability to ensure long-term access to their digital cultural and scientific assets

planets

Basic assumptions

- Digital assets have real long-term value
- The importance, size, and heterogeneity of digital collections is growing
- Technology change makes digital assets increasingly difficult to access
- Digital assets age and rapidly become damaged

New digital preservation technology can reduce costs and unlock access to older digital material

Aims and objectives

- **Increase Europe's ability to ensure long-term access to its cultural and scientific heritage**
  - Improve decision-making
  - Control costs through increased automation and scalable infrastructure
  - Ensure wide adoption across the user community
  - Establish a market place for preservation services and tools

- **Build practical, comprehensive solutions**
  - Integrate existing expertise, designs and tools
  - Deliver tools and services for operational environments

Benefits for archives and libraries

Planets will enable you to

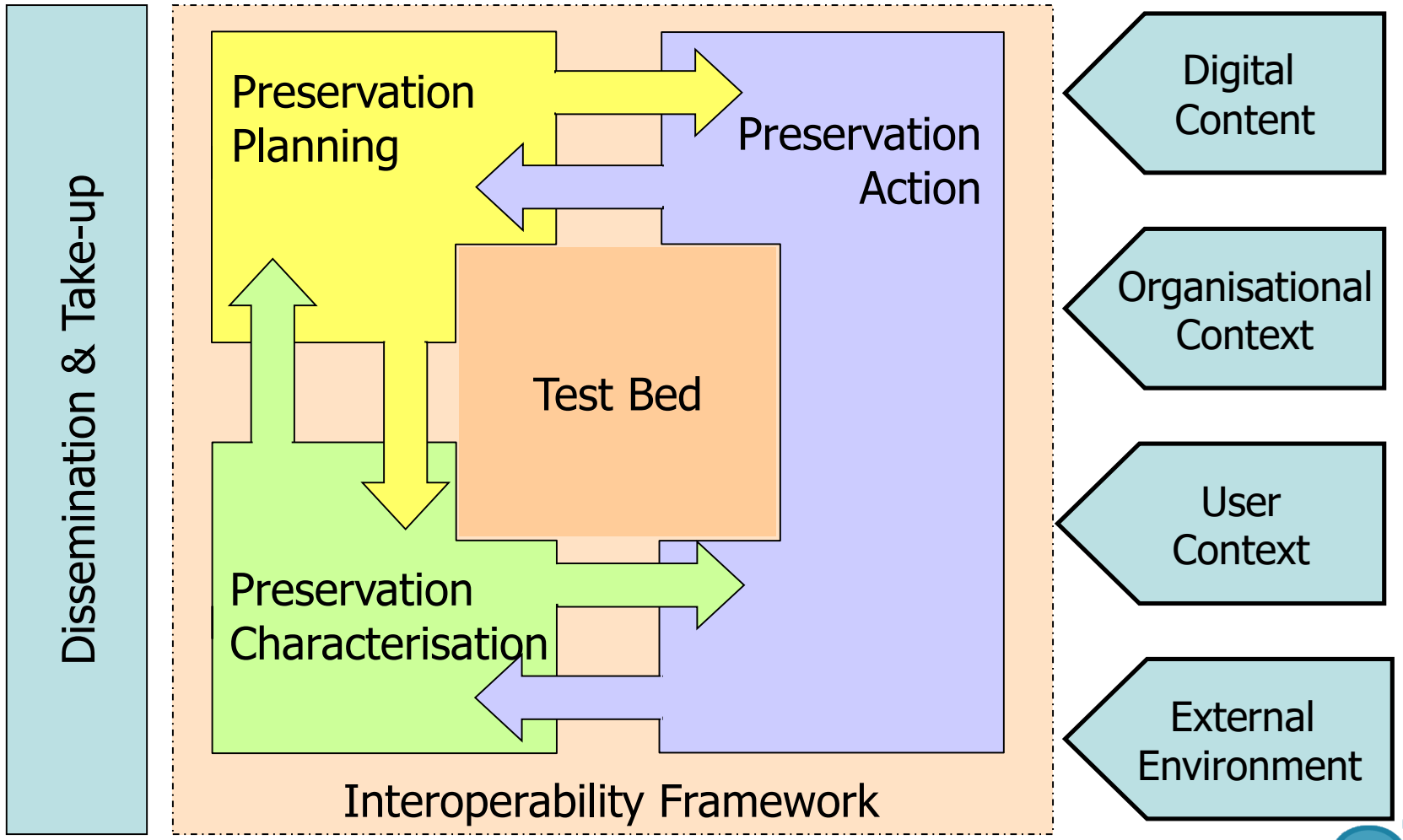
- Express your preservation policies
- Profile your digital collections
- Identify and diagnose problems in your digital collections
- Compare different treatment plans
- Select and implement treatments
- Verify that the treatment was successful
- Know which solutions work through empirical evidence
- Encourage vendors and service providers to provide these capabilities to you

“Planets will provide the technology component of our digital preservation solution”
Richard Boulderstone, BL Director, 15/06/07

Project Structure

- **Preservation Planning** services that empower organisations to define, evaluate and execute preservation plans
- Methods, tools and services for the **Characterisation** of digital objects
- **Preservation Action** tools which to transform and emulate digital assets
- An **Interoperability Framework** to seamlessly integrate Planets tools and services in a distributed service network;
- A **Testbed** to provide a consistent and coherent evidence-base for the objective evaluation of protocols, tools, services and complete preservation plans
- A comprehensive **Dissemination and Take-up** programme to ensure stakeholder adoption and training, as well as feedback

Project structure



Preservation planning – what should I do?

- Empower organisations to define, evaluate, and execute preservation plans
- Establish a planning methodology
- Understand the needs of content holders
- Understand the needs of content users
- Provide support, automation with the planning tool **Plato**
  - Help organisations build, select, document, and execute plans
- Understand the profile of a collection
- Provide technology watch services

Preservation characterisation – what do I have?

- Characterise the relevant properties of digital objects
  - Identify formats
  - Extract properties
  - Assess risks
- Characterisation framework brings together tools to identify file formats and extract object properties
- Characterisation registry holds the format and property information
- eXtensible Characterisation Languages (XC*L) allows automated extraction and comparable descriptions
- Comparator measures differences between descriptions and the impact of actions undertaken

Preservation action – what can I do?

- Transform content: Migration
  - Web service infrastructure for third-party tools to handle many common formats
  - Database migration: SIARD
- Transform environments: Emulation
  - GRATE and Dioscuri emulate older hardware/software environments
  - Universal Virtual Computer (UVC) provides a layered durable approach to emulation
- Preservation Action registry
  - holds descriptions of tools and services so that they can be found, compared, and invoked depending on the needs of particular content

Testbed – what really works?

- Develop a scientific evidence-base to evaluate tools, services, plans, and approaches
  - Better data for better decisions
- Define and run experiments locally with the Testbed application
- View, define, and run experiments on the supported Testbed service
- Use Testbed data in the Planets registries and in preservation planning
- Benchmark outcomes against previous experiments

Interoperability framework

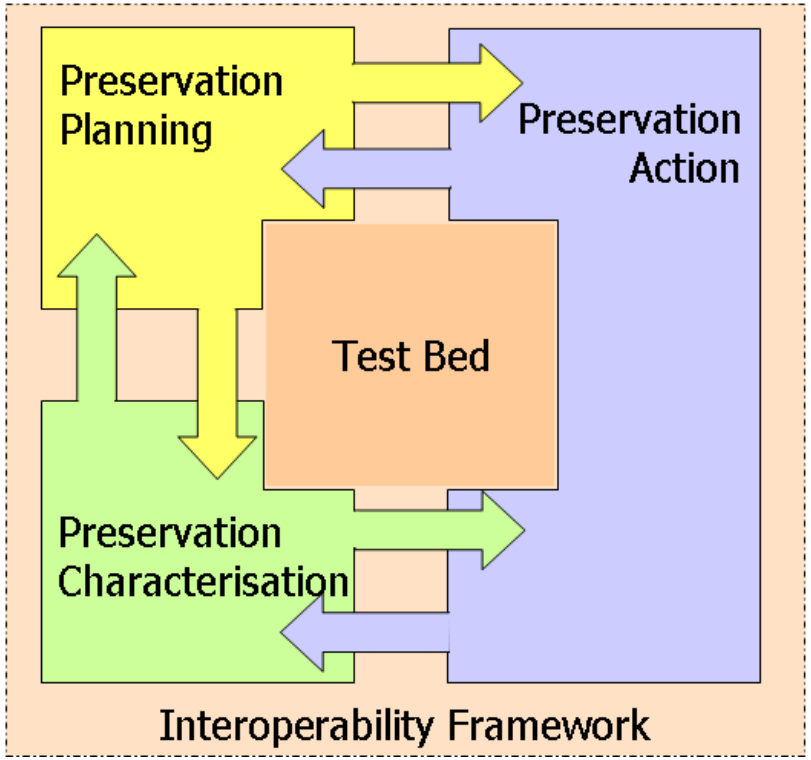
- The glue to hold the Planets tools and services together
- Enable third-parties to plug-in tools and services
- Enable vendors to integrate Planets preservation services
- Simple configurable installation
- Support for scalable distributed deployment
- Execute and manage workflows
- Provide shared services

Dissemination and take-up

- Ensure communities are aware of Planets and its value in easing preservation activity
- Ensure that Planets learns about community needs
- Collaborate with European and national organisations
- Explore and stimulate opportunities for take-up beyond project closure
- Track progress and impact

Cross-project links

- Interaction with standards, projects, and organisations
- JHOVE, JHOVE2, GDFR
- OAIS
- PREMIS
- METS
- OOXML
- PDF
- CASPAR, DPE, SHAMAN



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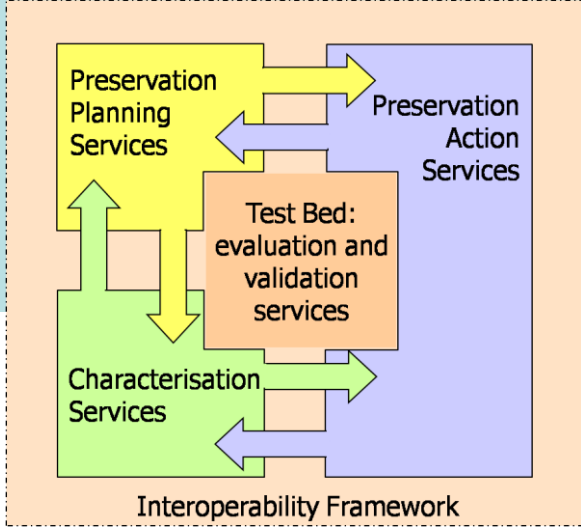
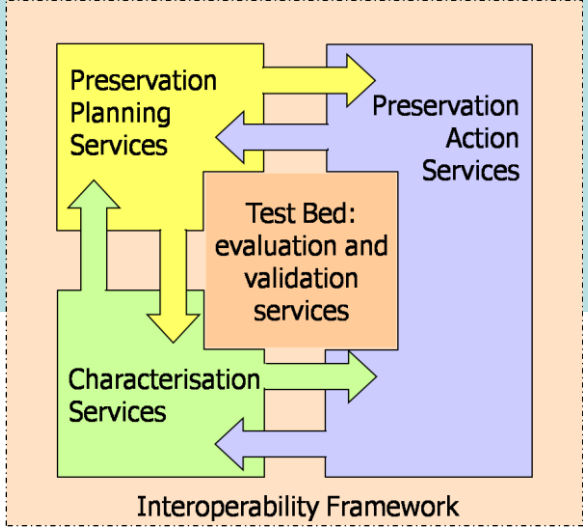
Preservation planning



- Collection profiling services
- Technology watch services
- Risk assessment of digital objects
- Preservation planning methodology
- Tool support: Plato, the Planning Tool

Preservation planning



- Collection profiling services
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- **Preservation planning methodology**
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Evaluating preservation strategies

- Variety of solutions and tools exist
- Each strategy has unique strengths and weaknesses
- Requirements vary across settings
- Decision on which solution to adopt is complex
- Documentation and accountability is essential

- Preservation planning assists in decision making
- Evaluation of strategies on representative sample content according to specific requirements

Decision support for preservation planning

- Systematic procedure for evaluating preservation strategies and building preservation plans
  - By conducting experiments on sample content
- Case studies
  - Electronic documents, interactive art, web archives...
  - Identify essential characteristics of objects and requirements for preservation strategies
  - Evaluate strategies and build plans
- Develop a decision support software
  - Plato – Planning Tool
  - Web application supporting the workflow

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Scenario: Changes in user community

- Repository of electronic publications
- Policy: 90% of users can access all published reports
- Usage profile: 98% of users can not view dvi files
- Content profile: 5% of published reports in dvi format

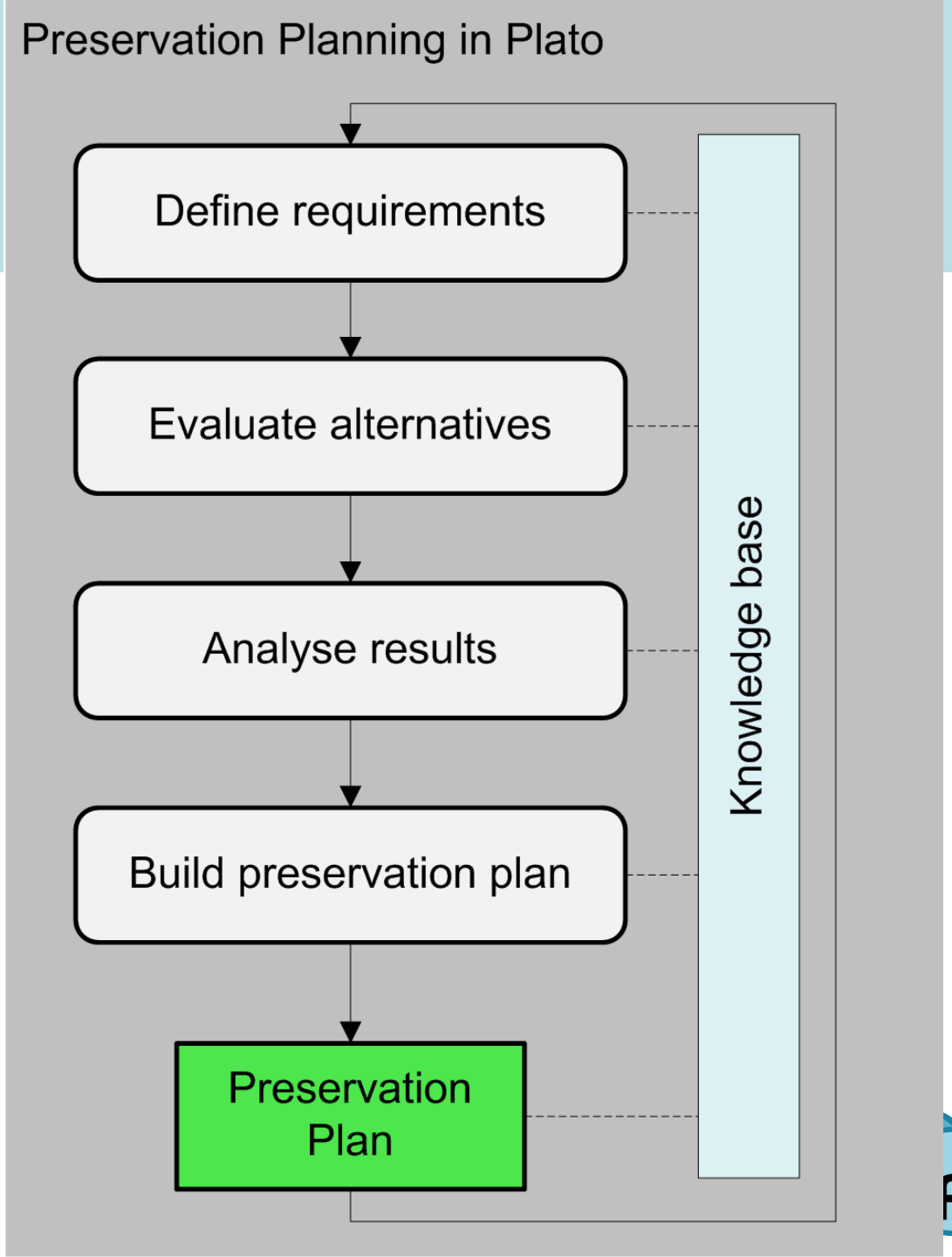
- Mission: Build and execute a plan for preserving access to these documents for the designated user community

Scenario (2)

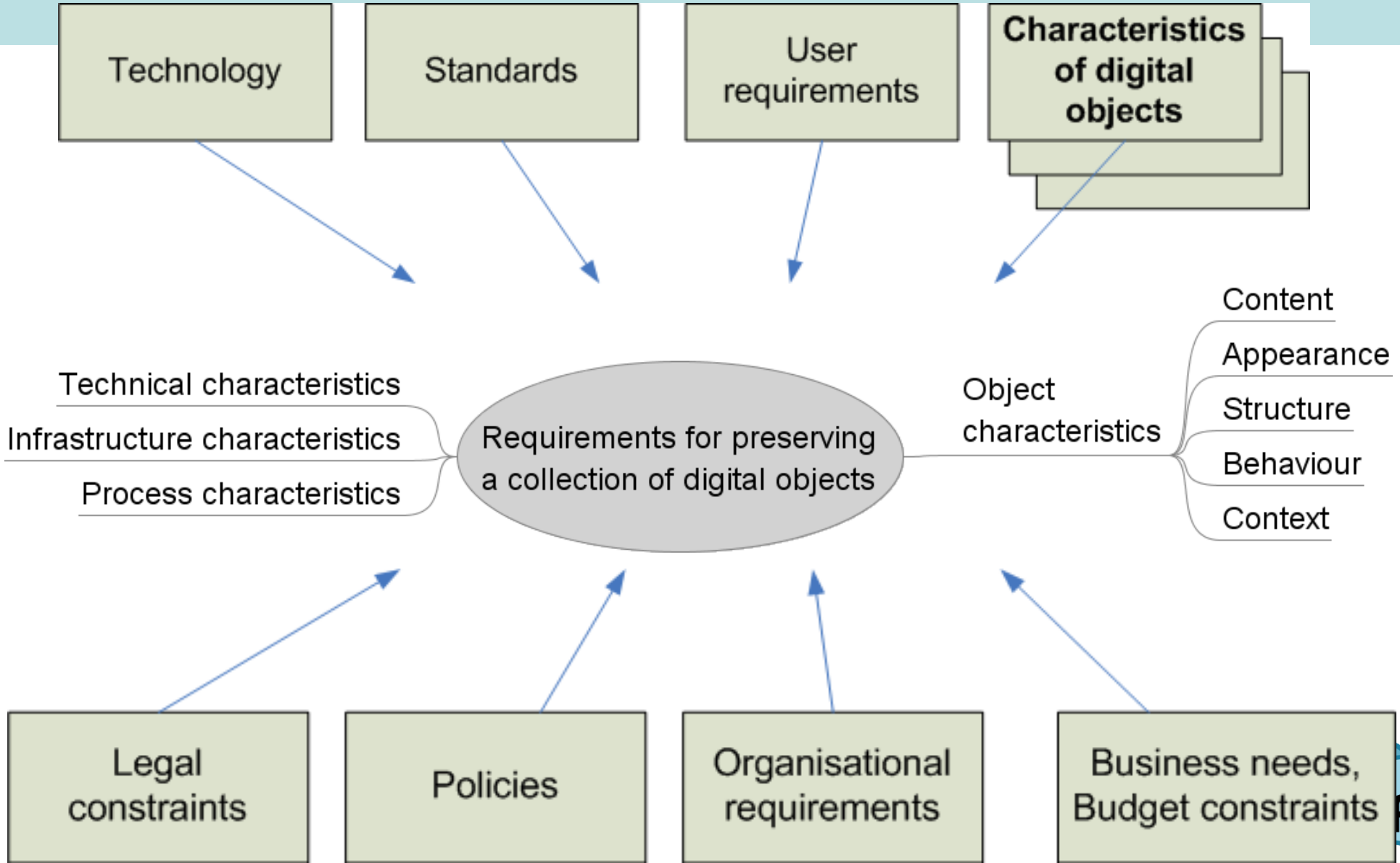
- Create a preservation plan with Plato
  - Define requirements
  - Identify possible actions using registries
    - Convert to PDF with Tool A
    - Convert to TIFF with Tool B
    - Provide users with a viewer plug-in
  - Evaluate actions on sample content
  - Build a preservation plan
- Convert content (using data registry)
- QA results (using comparison services)
- Ingest results into repository (using adaptor)

Workflow

1. Define requirements
2. Evaluate potential actions
3. Analyse the results
4. Build a preservation plan

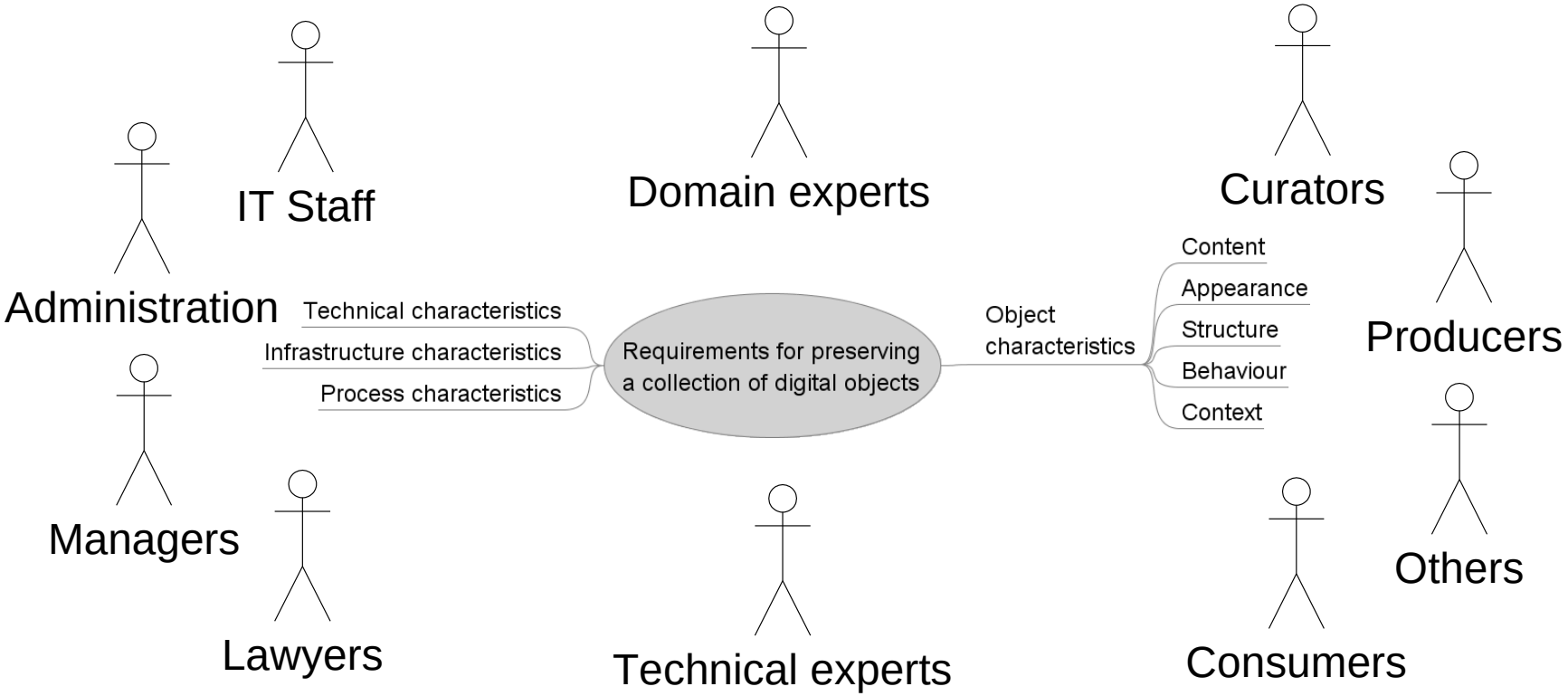


Influence Factors

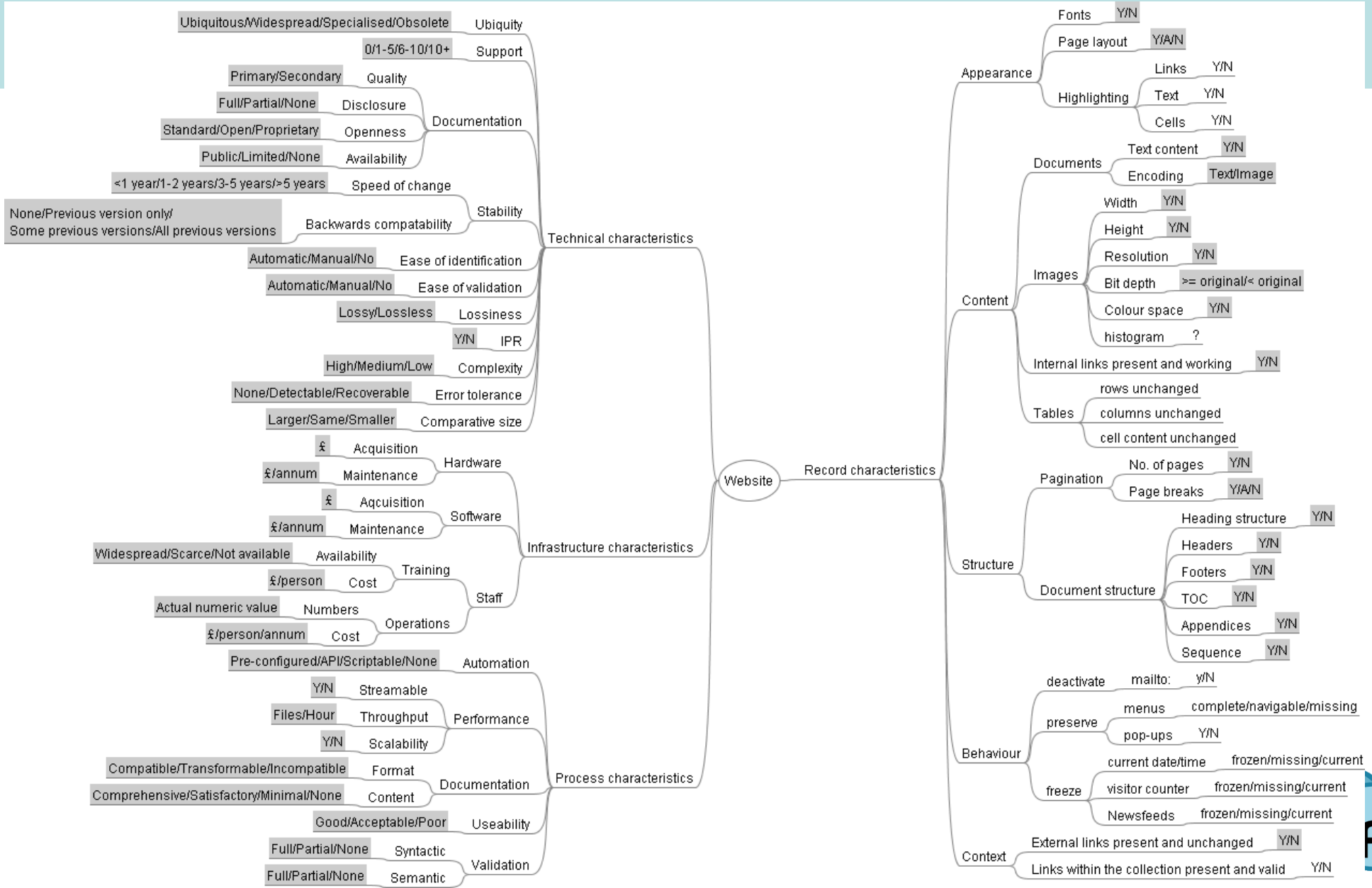


Stakeholders

- Input from a wide range of persons, depending on the institutional context and the collection



The Objective Tree



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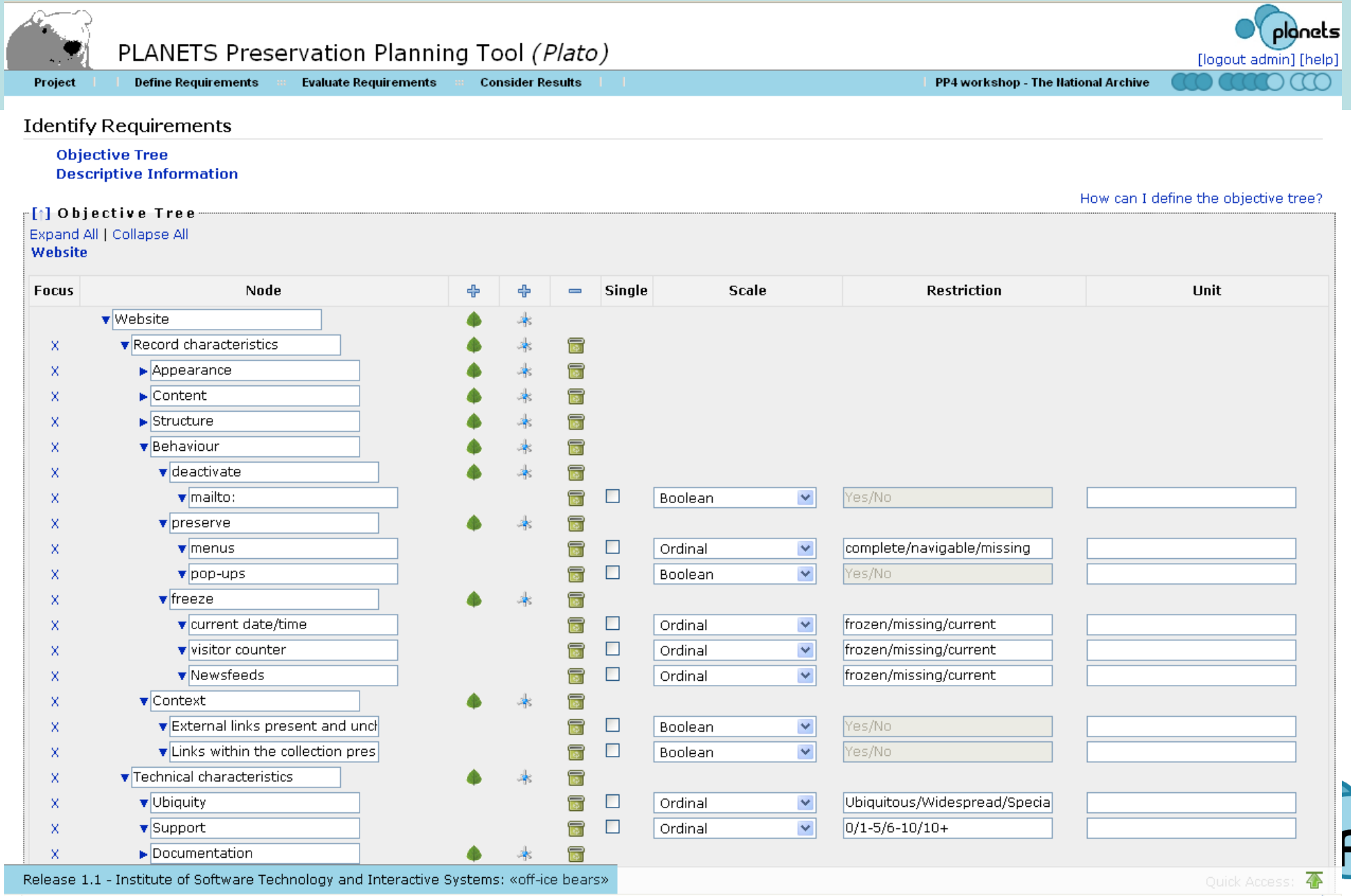
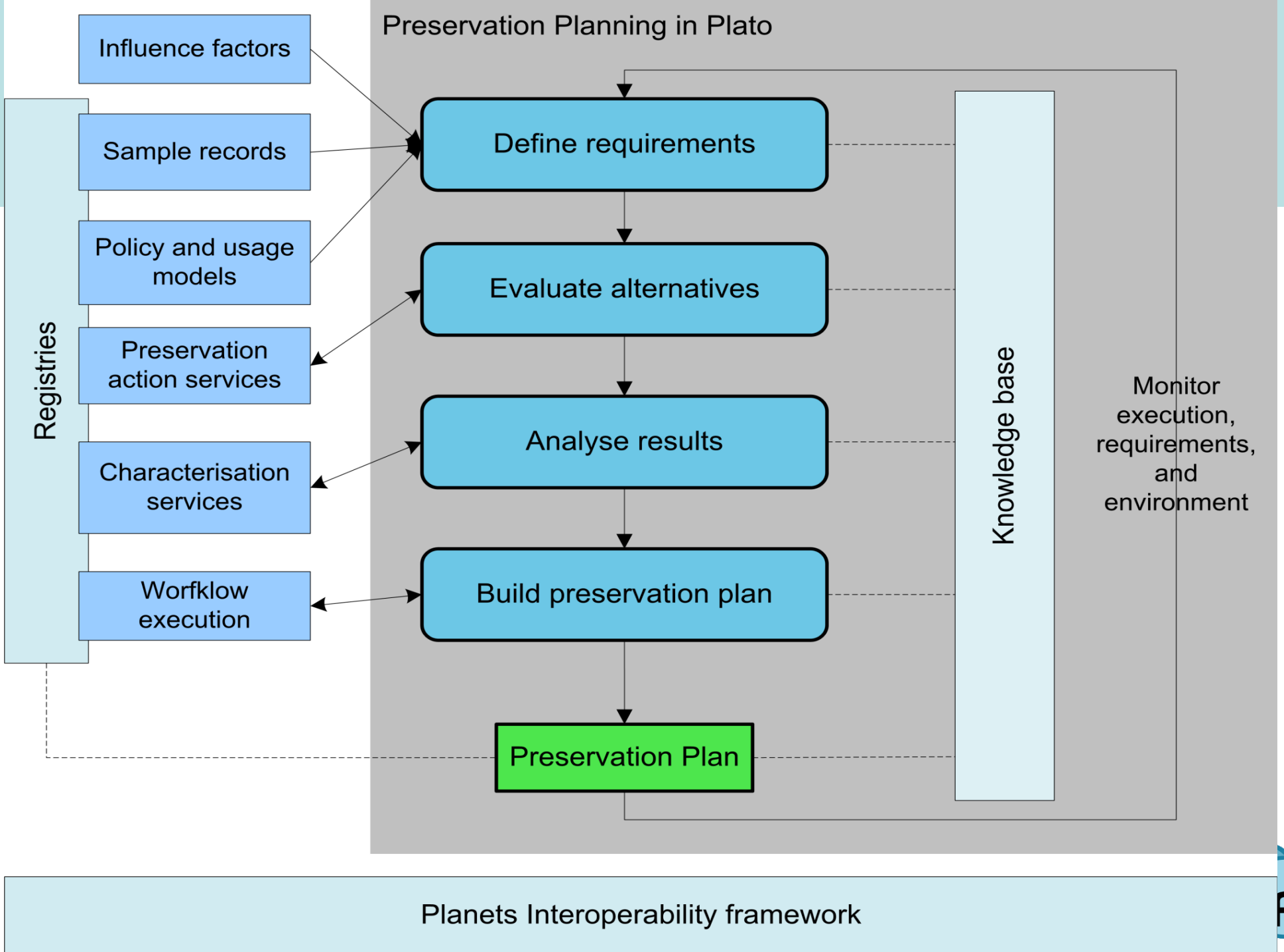


Focus	Node	Single	Scale	Restriction	Unit
	Website				
X	Record characteristics				
X	Appearance				
X	Content				
X	Structure				
X	Behaviour				
X	deactivate				
X	mailto:	☐	Boolean	Yes/No	
X	preserve				
X	menus	☐	Ordinal	complete/navigable/missing	
X	pop-ups	☐	Boolean	Yes/No	
X	freeze				
X	current date/time	☐	Ordinal	frozen/missing/current	
X	visitor counter	☐	Ordinal	frozen/missing/current	
X	Newsfeeds	☐	Ordinal	frozen/missing/current	
X	Context				
X	External links present and unch	☐	Boolean	Yes/No	
X	Links within the collection pres	☐	Boolean	Yes/No	
X	Technical characteristics				
X	Ubiquity	☐	Ordinal	Ubiquitous/Widespread/Specia	
X	Support	☐	Ordinal	0/1-5/6-10/10+	
X	Documentation				


Preservation Planning in Plato
Influence factors
Sample records
Policy and usage models
Preservation action services
Characterisation services
Worfklow execution
Registries
Define requirements
Evaluate alternatives
Analyse results
Build preservation plan
Preservation Plan
Knowledge base
Monitor execution, requirements, and environment
Planets Interoperability framework

Empirical evaluation of actions

- Define representative sample content
- Discover applicable actions in service registries
- Apply potential actions to sample content
- Evaluate outcomes
- Select most suitable action(s)
- Define an (executable) preservation plan

Analysing results

Results: Weighted multiplication

Result-Tree with all Alternatives, Aggregation method: Weighted multiplication

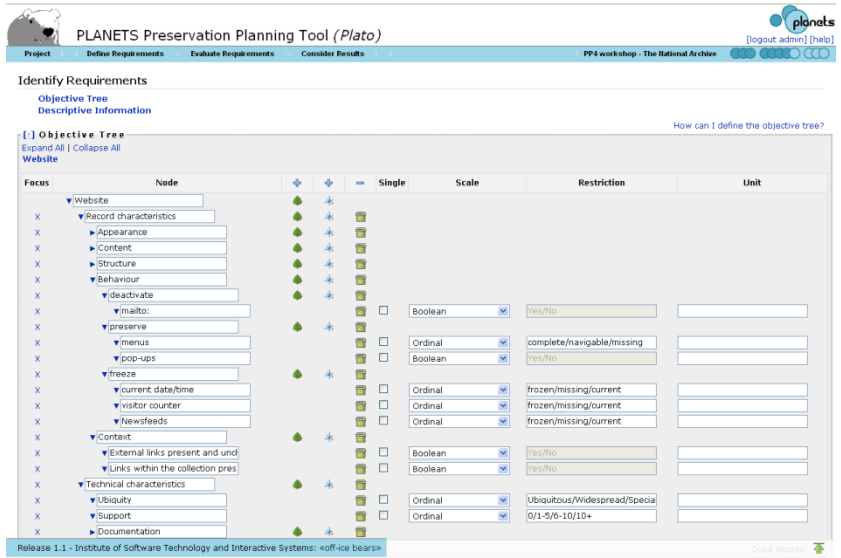
Expand All | Collapse All

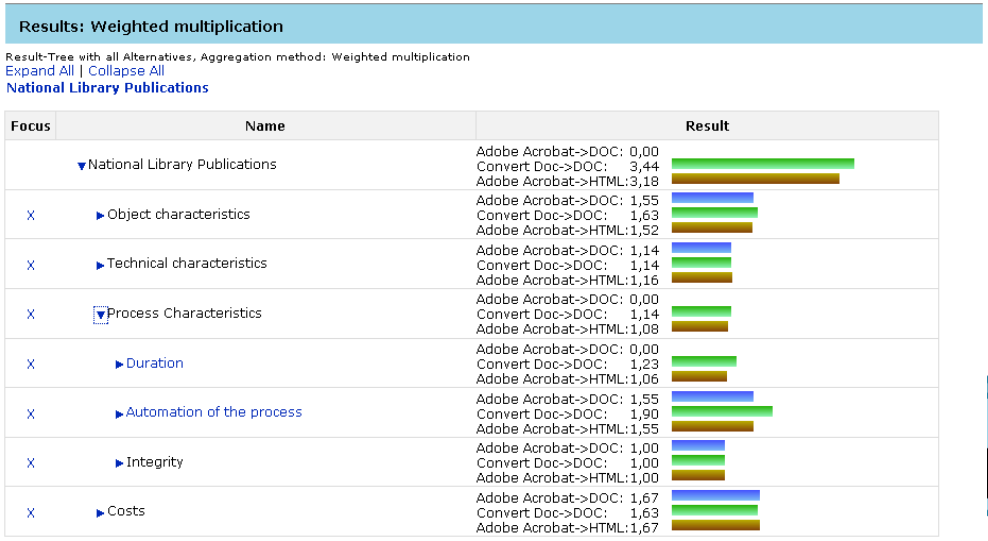
National Library Publications

Focus	Name	Result
	▼National Library Publications	Adobe Acrobat->DOC: 0,00 Convert Doc->DOC: 3,44 Adobe Acrobat->HTML: 3,18
X	▶Object characteristics	Adobe Acrobat->DOC: 1,55 Convert Doc->DOC: 1,63 Adobe Acrobat->HTML: 1,52
X	▶Technical characteristics	Adobe Acrobat->DOC: 1,14 Convert Doc->DOC: 1,14 Adobe Acrobat->HTML: 1,16
X	▼Process Characteristics	Adobe Acrobat->DOC: 0,00 Convert Doc->DOC: 1,14 Adobe Acrobat->HTML: 1,08
X	▶Duration	Adobe Acrobat->DOC: 0,00 Convert Doc->DOC: 1,23 Adobe Acrobat->HTML: 1,06
X	▶Automation of the process	Adobe Acrobat->DOC: 1,55 Convert Doc->DOC: 1,90 Adobe Acrobat->HTML: 1,55
X	▶Integrity	Adobe Acrobat->DOC: 1,00 Convert Doc->DOC: 1,00 Adobe Acrobat->HTML: 1,00
X	▶Costs	Adobe Acrobat->DOC: 1,67 Convert Doc->DOC: 1,63 Adobe Acrobat->HTML: 1,67

Summary

- Repeatable, decision making process
- Evaluate potential actions empirically
- Analyse results, take well-documented decision and build a preservation plan
- The planning tool Plato





What's next in Planets? (1/2)

- Preservation Planning tool: Plato 2.0
  - Version 1.3 available
  - Version 2.0 will be published in November
  - Integration of registries and services
- Integrated preservation planning services
  - risk assessment
  - automated collection profiling
  - technology watch
- Planets-compliant migration tools for digital objects
- Database migration: SIARD
- Emulation tools for specific environments

What's next in Planets? (2/2)

- Characterisation tools
  - extract significant properties from digital objects
  - compare different objects
- A characterisation description and extraction language (XCL)
- Characterisation and preservation action registries
- A controlled environment for the empirical assessment of services (Planets Testbed)
- Planets Interoperability Framework
  - as downloadable "click-and-install" software package

Dissemination and Take-up programme

- Workshops and training events
- Courses for example in
  - Vilnius, October 2007
  - Vienna, April 2008
  - Pisa, June 2008
  - London, July 2008
  - Prague, October 2008
  - ➢ **...Valencia, Spring 2009**
- Scientific publications
- Newsletter and web page

Conclusion

- Planets methods, tools, and services help organisations diagnose and treat problems with their digital objects
- High levels of automation and scalable components reduce costs and improve quality
- Empirical data enables improved decision making
- Find out more: http://www.planets-project.eu

Thank you very much for your attention.

www.planets-project.eu

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