Preserving Interactive Multimedia Art:
A Case Study in Preservation Planning

Christoph Becker, Günther Kolar, Josef Küng, Andreas Rauber

Outline

❑ Digital Preservation

❑ Preservation Planning

▪ Evaluating solutions

▪ Planets workflow and methodology

❑ Preserving interactive multimedia art

❑ Essential characteristics of interactive multimedia objects

❑ Current and future work

The Longevity of Digital Objects

- ❑ Digital objects are the dominant way we exchange information

- ❑ Heterogeneity and complexity of file formats and speed of technological change make long-term access a challenge

- ❑ Digital preservation: Long-term storage and access to digital objects

- ❑ Dominant strategies:
  - ▪ Migration
  - ▪ Emulation

# 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

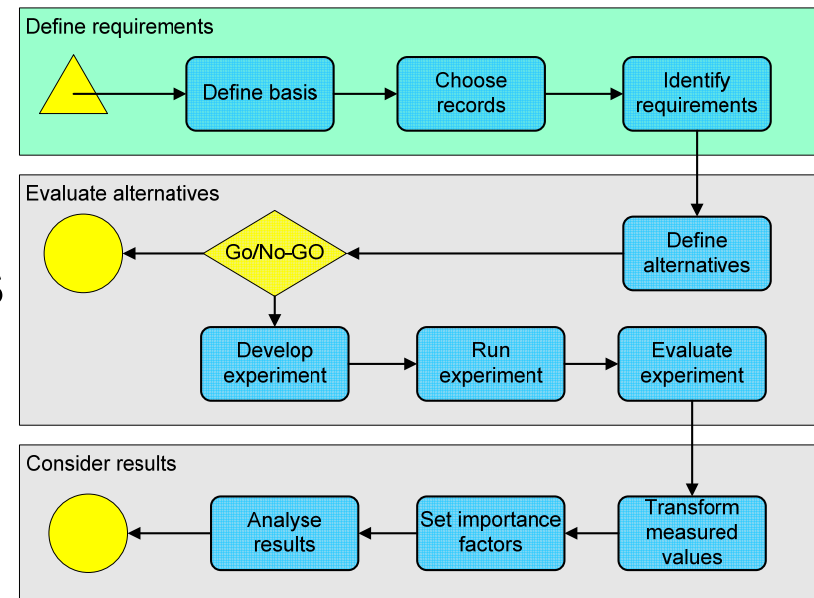❑ Evaluating preservation strategies on representative samples according to specific requirements and criteria

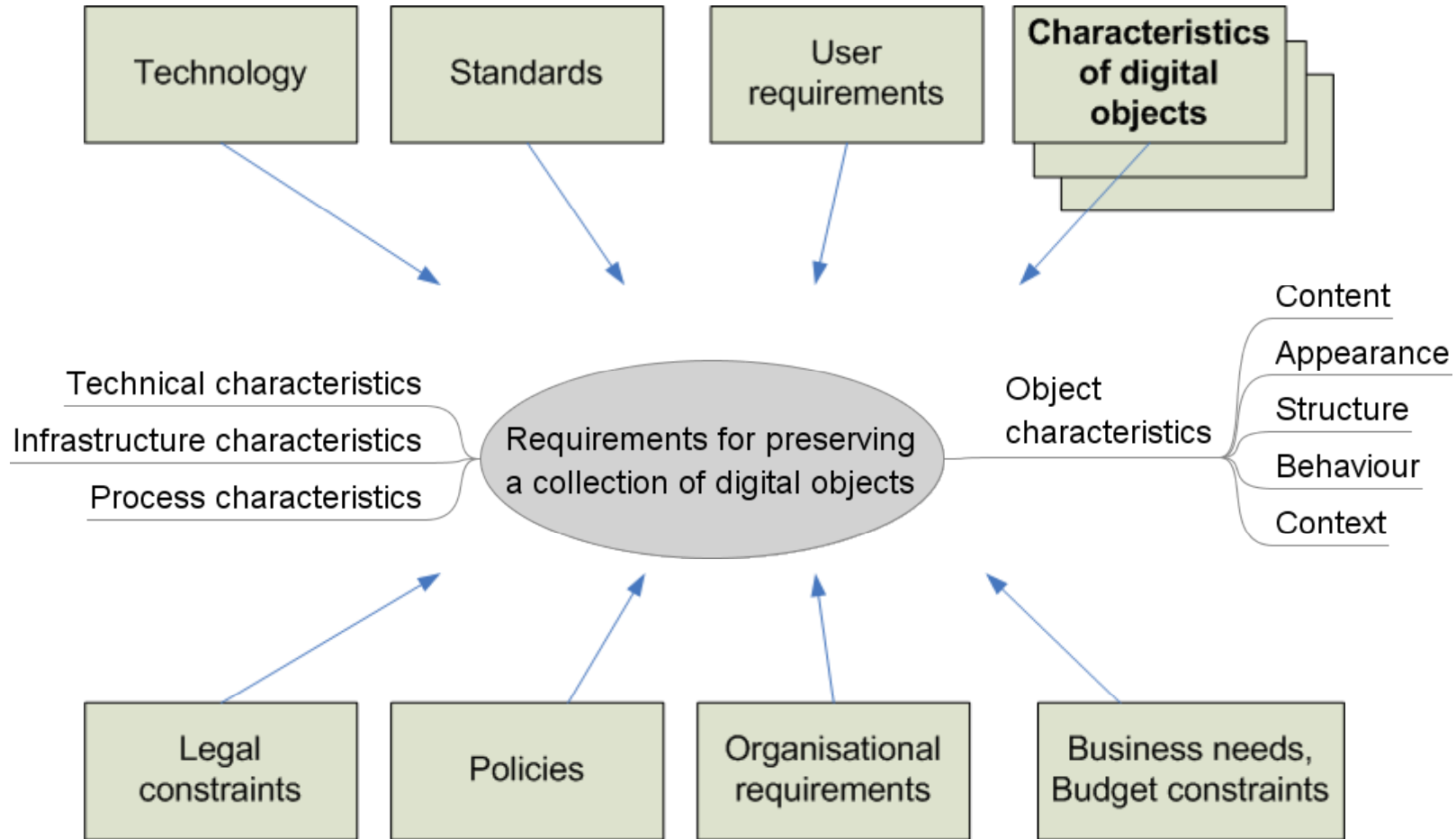# PLANETS Preservation Planning Workflow
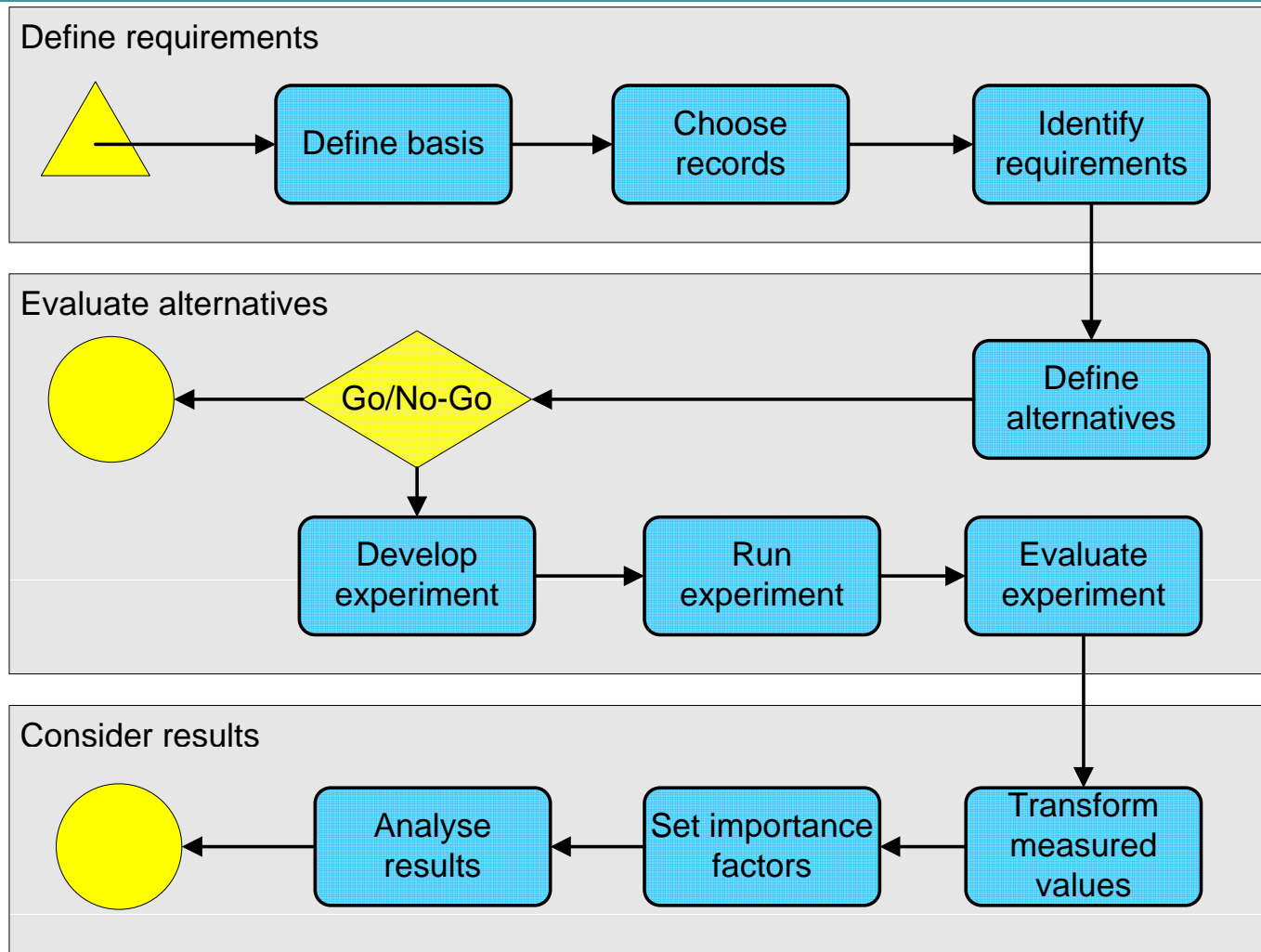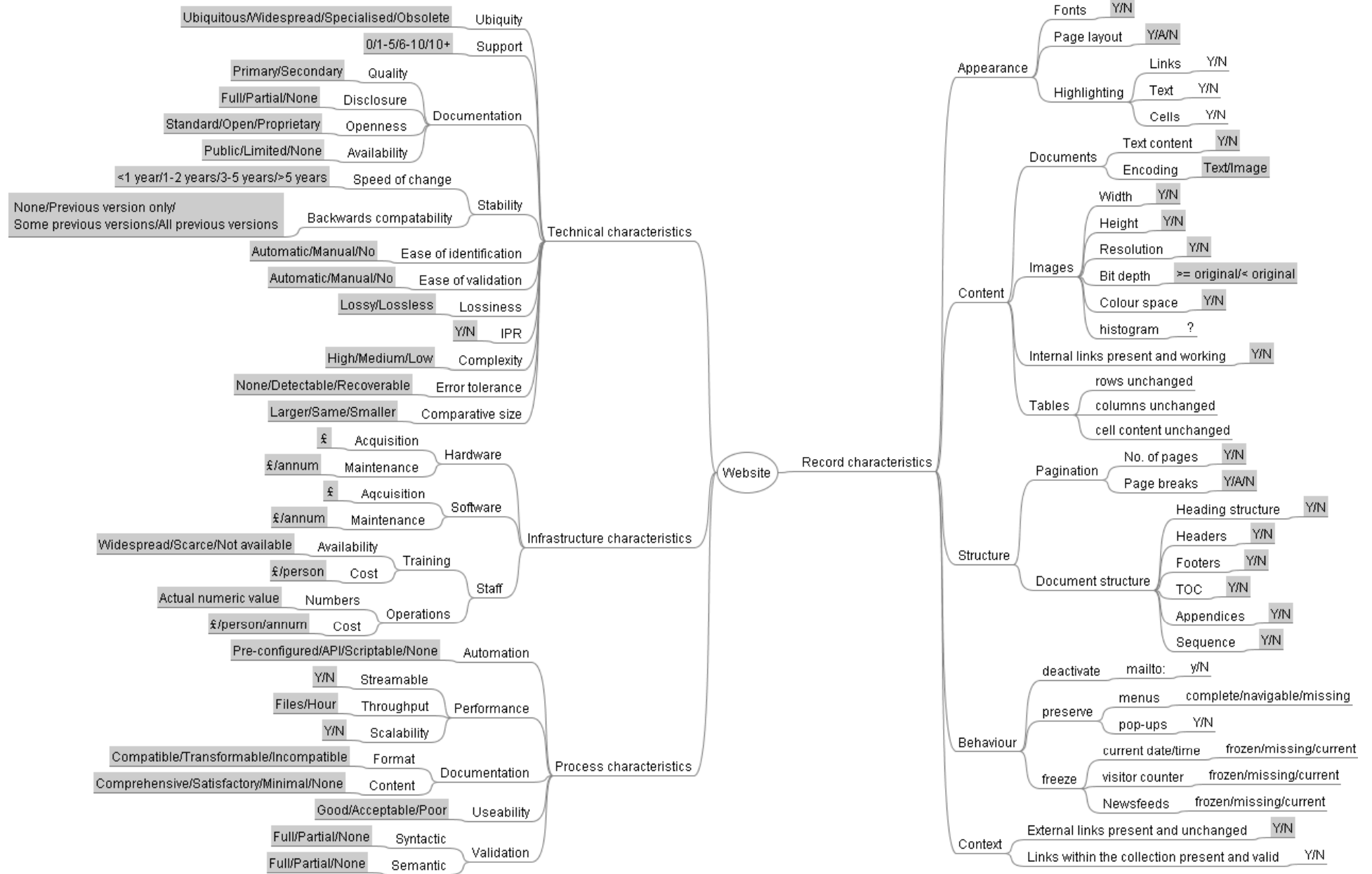
Phase 1: Define requirements

1. **Define basis**
   - Describe Collection
   - Institutional settings

2. **Choose sample objects/records**
   - Representative for the objects in the collection
   - Right choice of samples is essential

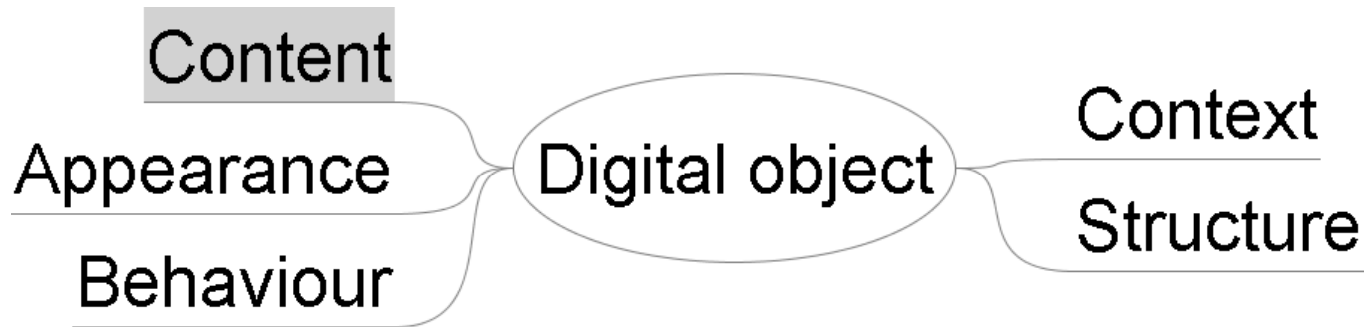3. **Define requirements**
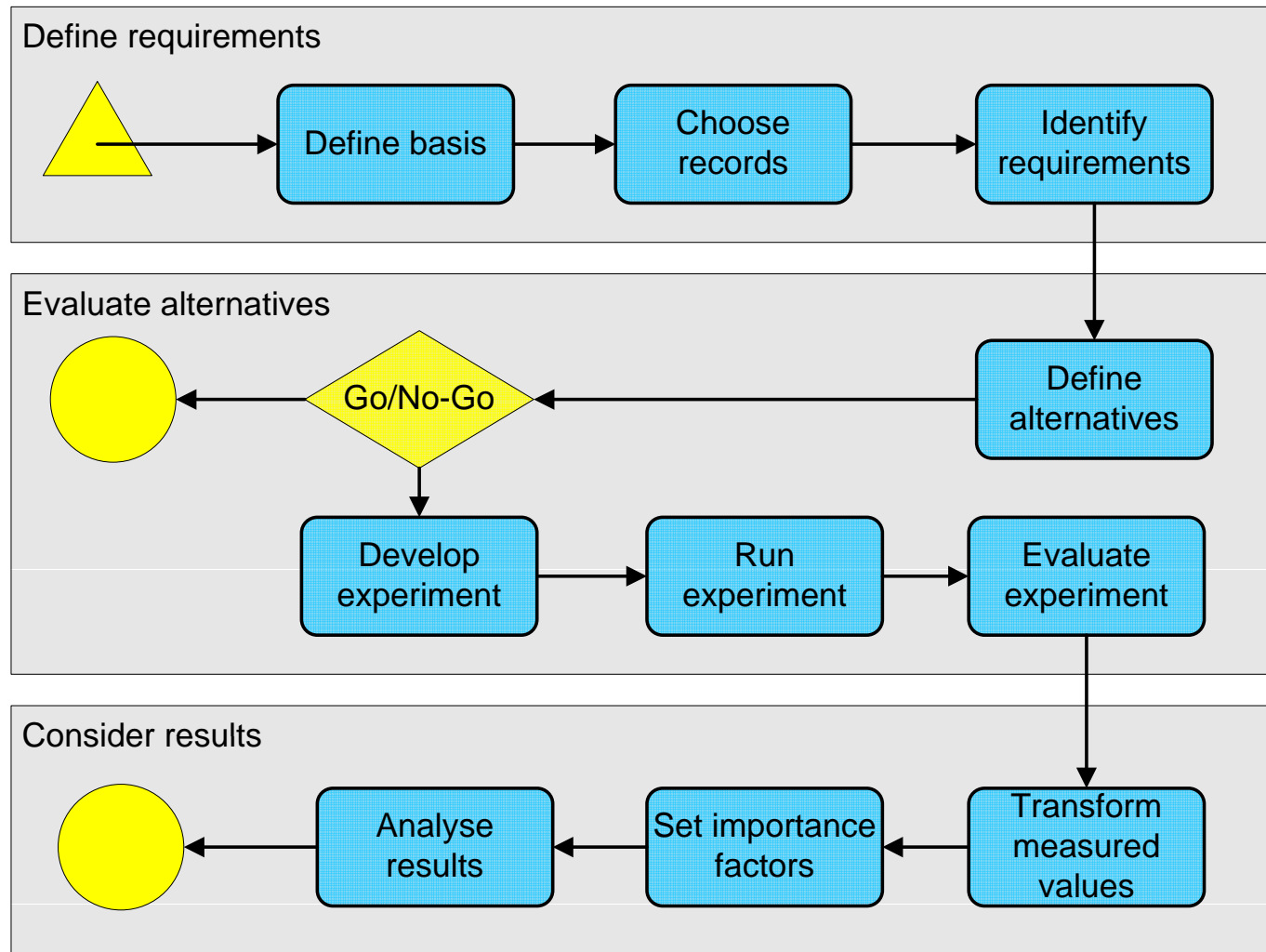   - "Objective tree"

Influence Factors

An Objective Tree

Technical characteristics

- Ubiquity — Ubiquitous/Widespread/Specialised/Obsolete
- Support — 0/1-5/6-10/10+
- Documentation
  - Quality — Primary/Secondary
  - Disclosure — Full/Partial/None
  - Openness — Standard/Open/Proprietary
  - Availability — Public/Limited/None
- Speed of change — <1 year/1-2 years/3-5 years/>5 years
- Stability
  - Backwards compatability — None/Previous version only/Some previous versions/All previous versions
- Ease of identification — Automatic/Manual/No
- Ease of validation — Automatic/Manual/No
- Lossiness — Lossy/Lossless
- IPR — Y/N
- Complexity — High/Medium/Low
- Error tolerance — None/Detectable/Recoverable
- Comparative size — Larger/Same/Smaller

Infrastructure characteristics

- Hardware
  - Acquisition — £
  - Maintenance — £/annum
- Software
  - Aqcuisition — £
  - Maintenance — £/annum
- Staff
  - Training
    - Availability — Widespread/Scarce/Not available
    - Cost — £/person
  - Operations
    - Numbers — Actual numeric value
    - Cost — £/person/annum

Process characteristics

- Automation — Pre-configured/API/Scriptable/None
- Performance
  - Streamable — Y/N
  - Throughput — Files/Hour
  - Scalability — Y/N
- Documentation
  - Format — Compatible/Transformable/Incompatible
  - Content — Comprehensive/Satisfactory/Minimal/None
- Useability — Good/Acceptable/Poor
- Validation
  - Syntactic — Full/Partial/None
  - Semantic — Full/Partial/None

Website — Record characteristics

Appearance

- Fonts — Y/N
- Page layout — Y/A/N
- Highlighting
  - Links — Y/N
  - Text — Y/N
  - Cells — Y/N

Content

- Documents
  - Text content — Y/N
  - Encoding — Text/Image
- Images
  - Width — Y/N
  - Height — Y/N
  - Resolution — Y/N
  - Bit depth — >= original/< original
  - Colour space — Y/N
  - histogram — ?
- Internal links present and working — Y/N
- Tables
  - rows unchanged
  - columns unchanged
  - cell content unchanged

Structure

- Pagination
  - No. of pages — Y/N
  - Page breaks — Y/A/N
- Document structure
  - Heading structure — Y/N
  - Headers — Y/N
  - Footers — Y/N
  - TOC — Y/N
  - Appendices — Y/N
  - Sequence — Y/N

Behaviour

- deactivate
  - mailto: — y/N
- preserve
  - menus — complete/navigable/missing
  - pop-ups — Y/N
- freeze
  - current date/time — frozen/missing/current
  - visitor counter — frozen/missing/current
  - Newsfeeds — frozen/missing/current

Context

- External links present and unchanged — Y/N
- Links within the collection present and valid — Y/N

The five aspects of an object

Evaluate alternatives and analyse results

PLANETS Preservation Planning Tool - Mozilla Firefox

Datei   Bearbeiten   Ansicht   Chronik   Lesezeichen   Extras   Hilfe

http://localhost:8080/plato/workflow/analyseresults.seam

PLANETS Preservation Planning Tool *(Plato)*

[logout] [Export to XML] [help]

| Project | Define Requirements | Evaluate Requirements | Consider Results | Project 'Minimalist test project covering all features' is in state WEIGHTS_SET |

Analyse Results

Sum ▼

| ☑ | PDF/A (Tool A) |
| ☑ | PDF/A (Tool B) |

[Show]

Expand All | Collapse All
Minimalist root node

Focus	Name	Result
	▼ Minimalist root node	PDF/A (Tool A): 2,98 PDF/A (Tool B): 3,19
X	▶ Image properties	PDF/A (Tool A): 0,70 PDF/A (Tool B): 0,80
X	▼ Karma	PDF/A (Tool A): 0,40 PDF/A (Tool B): 0,00
X	▼ Filesize (in Relation to Original)	PDF/A (Tool A): 0,78 PDF/A (Tool B): 0,99
X	▼ A Single-Leaf	PDF/A (Tool A): 0,40 PDF/A (Tool B): 0,80
X	▼ IntRange 0-10	PDF/A (Tool A): 0,70 PDF/A (Tool B): 0,60

(Version 0.5) Institute of Software Technology and Interactive Systems: «office bears»

Quick Access:

Fertig

The Challenge

❑ Interactive...

- Integrated applications
- Obscure presentation formats
- Highly proprietary and heterogeneous collection

❑ Multimedia...

- Complex, proprietary , often obsolete formats

❑ ...Art

- Highly sensitive material
- No conformance to a submission policy
- What is the 'original'?
- Artists might even object to preservation

Profiles of digital object collections
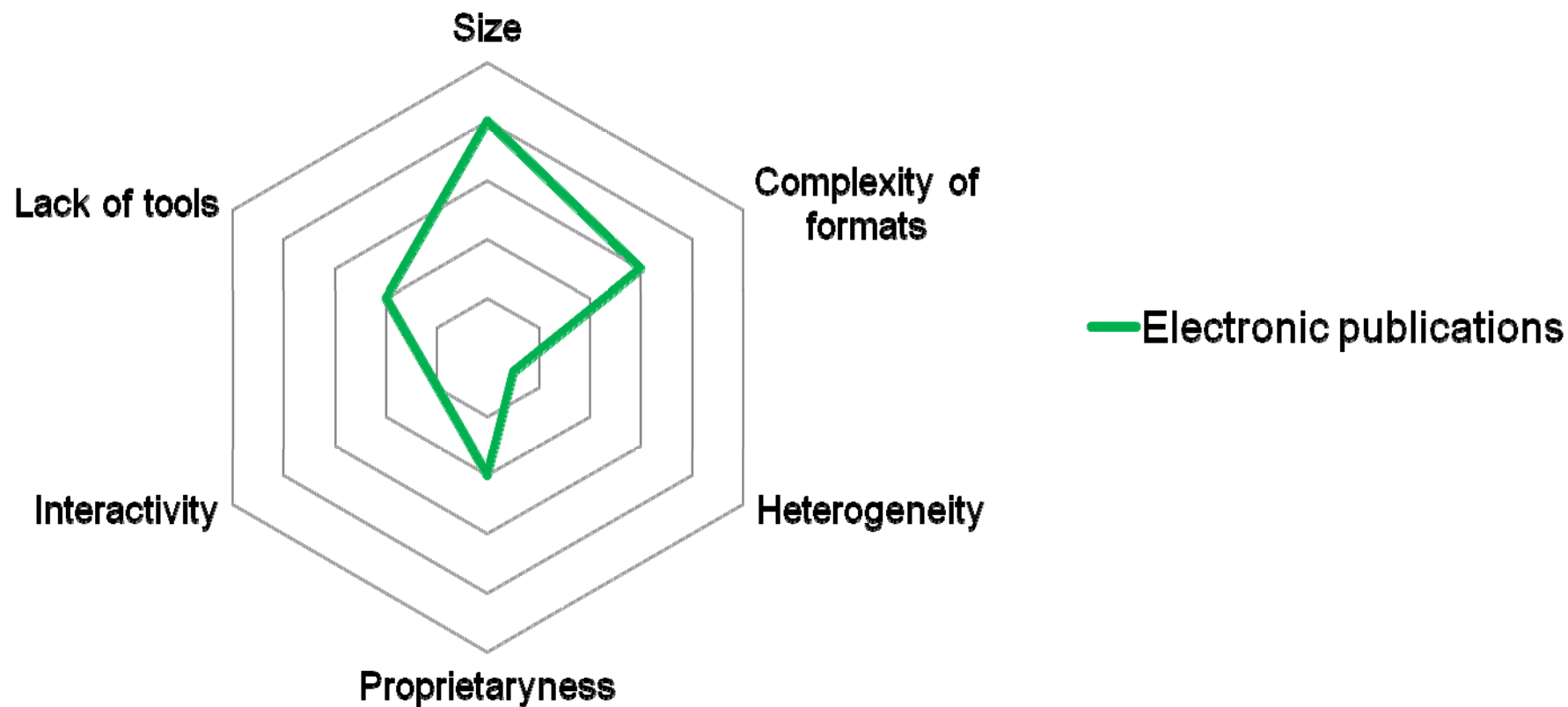
Profiles of digital object collections
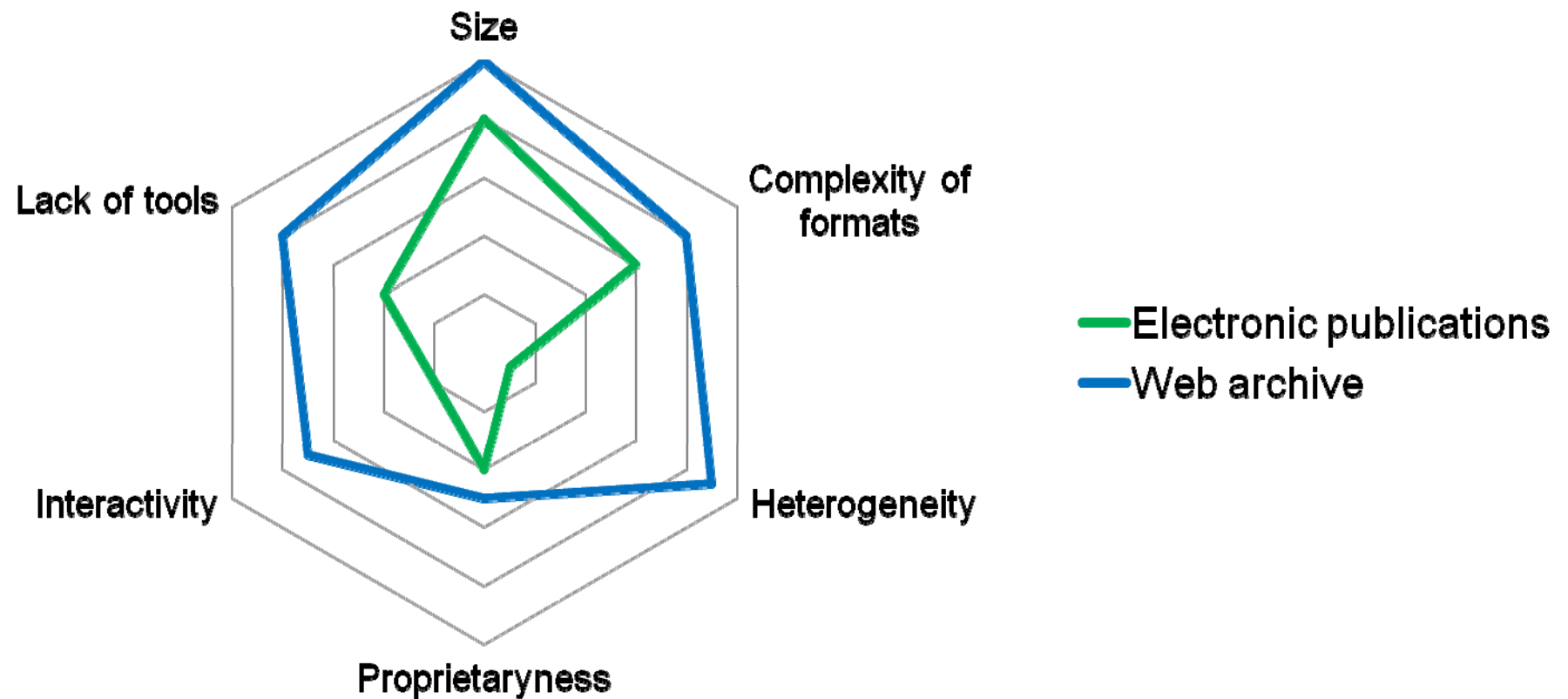
Profiles of digital object collections
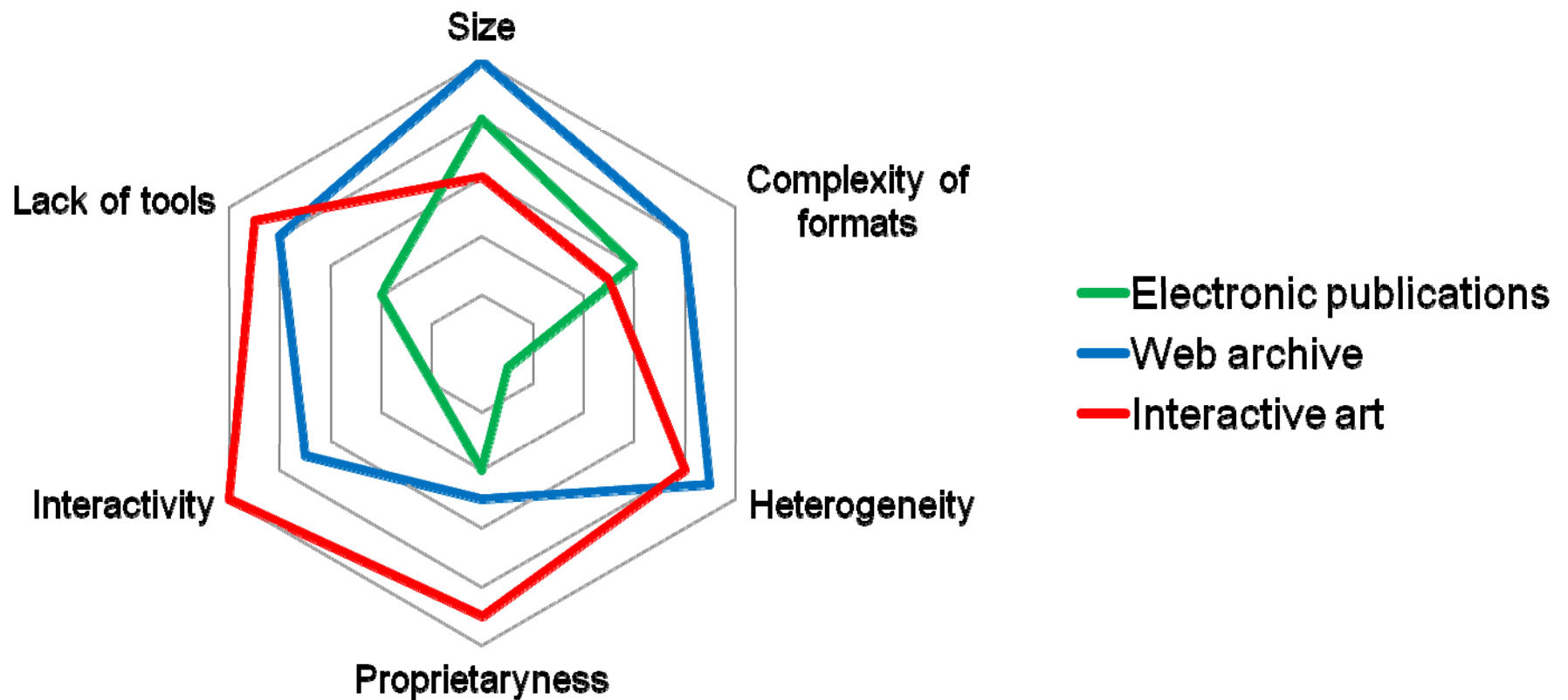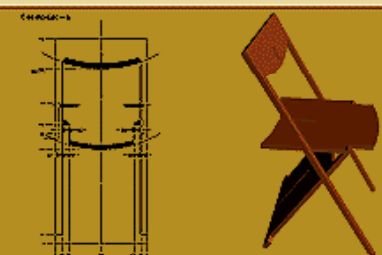
The Ars Electronica collection

- One of the worlds largest collections of electronic art
  - ~30.000 pieces, 3.000 new each year
  - 6.200 CDs containing multimedia and interactive art
  - 1.200 interactive art

- Ludwig Boltzmann Institute and Vienna University of Technology

- Planets case study in preservation planning
  - Identifying essential characteristics that need to be preserved

Examples

Essential object characteristics

Importance of object characteristics
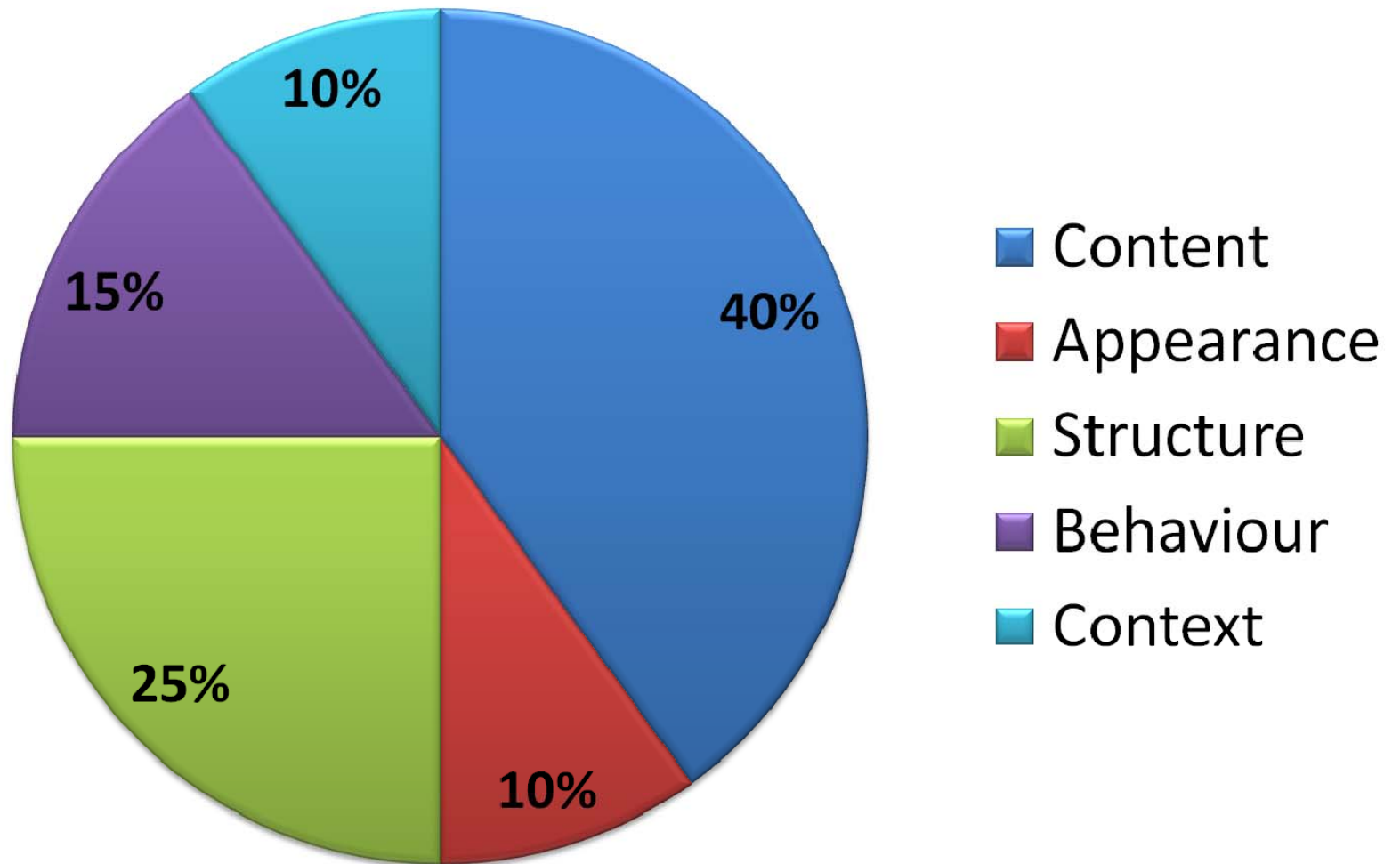
How to measure interactivity?

- Interactive presentations exhibit two facets
  - Graph-like navigation structure
  - Navigation along the paths

Results of requirements elicitation

- Defined and documented the context of the preservation problem of interactive multimedia
  - Challenging digital preservation problem
  - Heterogeneous collections in proprietary formats
  - High degree of interactivity
- Defined and documented representative samples for performing experiments
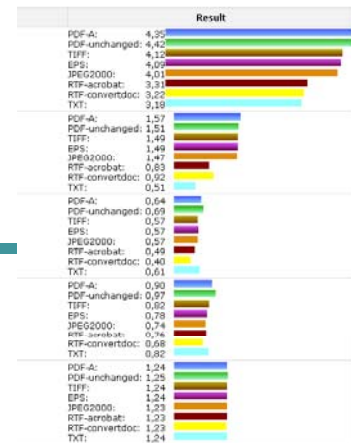- Defined and documented requirements
- Essential object characteristics

Evaluating strategies for interactive objects

❑ Evaluation of emulation, simulation and migration approaches for console video games

   ❑ Emulation is a viable solution for console video games

   ❑ Even early video game systems not emulated perfectly

   ❑ Migration to video as a documentation of the original work
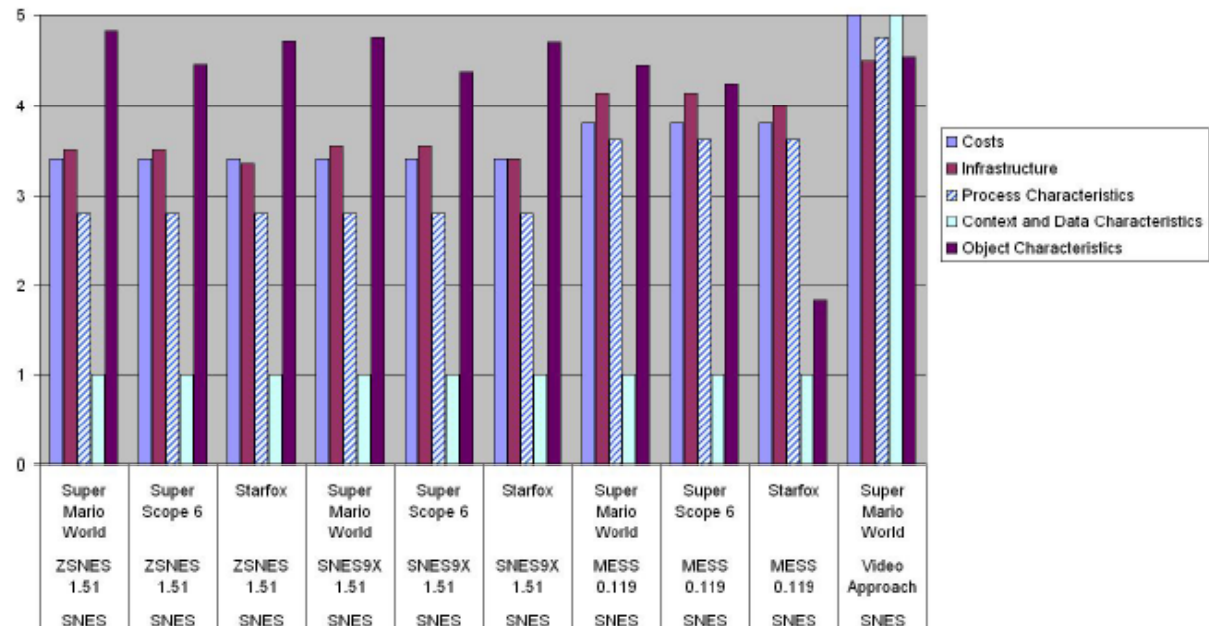
Current work

- Evaluate selected strategies
  - Improve and develop, based on gap analysis

- OAIS model integration

- Audit and Certification of PP activities
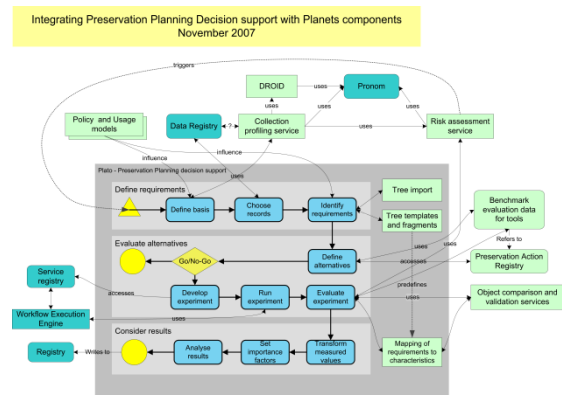
- Tool support: Service integration

Something different…
the DPE Digital Preservation Challenge

- Competition with several tasks to solve
- Digital Preservation Europe: coordinating EU project
- Overcome the barriers hindering access to digital objects
- Scenarios based on real-life situations

Awards
1. First Prize 3000 Euros
2. Second Prize 1500 Euros
3. Third Prize 500 Euros

Next challenge online in January, submission deadline Spring 2008
Flyers available

www.digitalpreservationeurope.eu/challenge

Thank you very much for your attention.

becker@ifs.tuwien.ac.at
www.ifs.tuwien.ac.at/dp
www.planets-project.eu