

# JOINT INFORMATION SYSTEMS COMMITTEE

## Invitation To Tender

**Studies to investigate the significant properties of four different types of digital object for digital preservation purposes: e-learning objects, software, vector images and moving images.**

### Summary

1. This document invites proposals for 4 separate studies to identify and analyse the significant properties of four different types of digital objects for digital preservation purposes: e-learning objects, software, vector images and moving images. For each object type, the contractors are required to develop a model for expressing significant properties and propose standard ways of expressing these in the form of templates.
2. Funding of up to £40,000 (including VAT and expenses) is available for each of the four studies. The deadline for proposals is 1300 hours on Thursday 19<sup>th</sup> April 2007.

### Background

3. JISC supports higher and further education by providing strategic guidance, advice and opportunities to use Information and Communications Technology (ICT) to support research, teaching, learning and administration. JISC is funded by all the UK post-16 and higher education funding councils.
4. Long-term preservation and access to scholarly and education materials that are central to the HE/FE community have been considered an important strategic area by JISC. Working together with other bodies, JISC has been leading the work in tackling the complex issues and challenges of digital preservation which are exceptionally difficult for institutions to address individually. Much has been achieved by JISC through an ongoing digital preservation and records management programme<sup>1</sup>, which consists of studies, community calls and national initiatives such as the Digital Curation Centre.<sup>2</sup>
5. Significant properties, also referred to as “significant characteristics” or “essence”, are essential attributes of a digital object which affect its appearance, behaviour, quality and usability. They can be grouped into categories such as content, context (metadata), appearance (e.g. layout, colour), behaviour (e.g. interaction, functionality) and structure (e.g. pagination, sections). Significant properties must be preserved over time for the digital object to remain accessible and meaningful.
6. It is important to understand that significant properties of an object are not fixed traits. Some properties are common and can be applied to a particular type of objects. The level of significance of other properties, however, is subject to subjective judgement depending on the different contexts of creation and use. In some cases, for example, it may be decided that the textual content of a document is the most important element, properties such as layout and colour are not essential to its intellectual meaning; in other cases, if the “look and feel” of the original document forms part of its intellectual content and is considered significant by the creator and the users, then the “look and feel” needs to be preserved. Many factors affect the decisions about which significant properties to maintain, such as institutional priorities, anticipated use by and the knowledge of the designated community, the types of materials involved, and the financial and technical means available.
7. Proper understanding of the significant properties of digital objects is critical to establish best practice approaches to digital preservation. It assists appraisal and selection, processes in which choices are made about which significant properties of digital objects are worth preserving; it helps the development of preservation metadata, the assessment of different

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<sup>1</sup> JISC Digital Preservation and Records Management Programme:  
[http://www.jisc.ac.uk/whatwedo/programmes/programme\\_preservation](http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation)

<sup>2</sup> Digital Curation Centre: <http://www.dcc.ac.uk>

preservation strategies and informs future work on developing common standards across the preservation community. In addition, significant properties are a useful starting point to develop our understanding of complex digital objects, for which little digital preservation research or practical work have been undertaken.

8. Early research on significant properties was undertaken by the JISC funded CEDARS project, albeit defined under a different name as “the level of content and functionality retained”. The concept was adopted and further developed by the CAMiLEON Project, which developed a model for expressing significant properties and used this to assess emulation as a digital preservation strategy.<sup>3</sup> A conclusion by the CAMiLEON project was that further articulation of significant properties was needed for specific types of digital objects and collections for particular communities.
9. In recent years, the need to identify such properties has been highlighted within a number of notable digital preservation programmes. These include the National Archives of Australia, the Electronic Record Archives programme at the National Archives and Records Administration, The National Archives’ Seamless Flow programme in the UK, and the EU-funded DELOS project. However, work to date has remained at formative stage. It is widely recognised that there is a need for research on practical application of this approach, to develop a methodology and begin identifying quantifiable sets of significant properties for specific classes of digital object. To address this need JISC recently funded the InSPECT project<sup>4</sup>, led by the Arts and Humanities Data Service in partnership with the National Archives, to develop and expound the concept of ‘significant properties’ of digital objects, and to analyse a range of digital objects in order to develop a generalised methodology for determining the significant properties of digital object types. The digital object types which will be examined by InSPECT include raster images, digital audio, structured text and email. Parallel to InSPECT, both the PLANETS project and the CASPAR project, recently funded by the European Union within the Sixth Framework Programme, include threads of work with related goals. The PLANETS project<sup>5</sup> aims to deliver tools that can automatically analyse digital objects to establish significant properties. The CASPAR project<sup>6</sup> will investigate the “representation information”, which includes significant properties, of a wide range of data sets in science, arts and cultural heritage.
10. As components of the ongoing Digital Preservation and Records Management programme, JISC has in the past funded feasibility and scoping studies covering major areas of JISC and institutional digital collections to assess preservation risks and retention criteria. Findings and recommendations by these studies have helped inform and prioritise JISC’s development work. Examples of the studies include the *Digital Images Archiving Study*<sup>7</sup> and the *Moving Images and Sound Archiving Study*<sup>8</sup> which recommended research on the significant properties of these complex digital object types. In addition preliminary discussions have taken place with the community about the long-term preservation of e-learning objects and software. It is recognised that both possess specific characteristics and are extremely complex. Appreciation of their significant properties would provide a useful starting point to improve our understanding and hopefully lead to appropriate preservation approaches to endure their long-term availability.

## Aims and Objectives

11. The aims of the studies are to complement the InSPECT project and expand the portfolio of digital object types to include e-learning objects, software, vector images and moving images. By identifying and analysing the significant properties of these digital object types (or sub-types

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<sup>3</sup> Margaret Hedstrom, Christopher A. Lee, *Significant properties of digital objects: definitions, applications, implications*, 2002. [http://www.ils.unc.edu/caltee/sigprops\\_dlm2002.pdf](http://www.ils.unc.edu/caltee/sigprops_dlm2002.pdf).

<sup>4</sup> Investigating the Significant Properties of Electronic Content Over Time (InSPECT) <http://www.ahds.ac.uk/about/projects/inspect/>

<sup>5</sup> Preservation and Long-term Access via Networked Services (PLANETS): <http://www.planets-project.eu>

<sup>6</sup> Cultural, Artistic and Scientific knowledge for Preservation, Access and Retrieval (CASPAR): <http://www.casparpreserves.eu/>

<sup>7</sup> Digital Images Archiving Study:

[http://www.jisc.ac.uk/whatwedo/programmes/programme\\_preservation/imagesarchiving](http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation/imagesarchiving)

<sup>8</sup> Moving Digital Images and Sound Archiving Study:

[http://www.jisc.ac.uk/whatwedo/programmes/programme\\_preservation/project\\_movingimagesound](http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation/project_movingimagesound)

within them), it is hoped that their complexity and characteristics will be better understood, which should lead to more focused research and development work to establish best practices for their long-term preservation.

12. The objectives of each of the 4 studies are:
  - i. Discuss and analyse how the concept of “significant properties” applies to each of the object types, including an assessment of the working definition of “significant properties” produced by the InSPECT project.<sup>9</sup>
  - ii. Develop a conceptual model for expressing significant properties for each of the object types, which should at least consider and accommodate the following:
    1. the relationship between significant properties and designated community
    2. the factors that impact the level of significance
    3. the distinction between properties which can be commonly applied to each object type and those which require subjective judgement
  - iii. Propose standard ways of expressing significant properties for each of the object types, in the form templates.
  - iv. Apply the model and templates and set out the significant properties for each object type.
  - v. Recommend areas of future research.
  - vi. The contractor undertaking the study on e-learning objects should include a proposed classification of e-learning objects.
  - vii. The contractor undertaking the study on software should develop an appropriate working definition for the project and start with a proposed classification of software. The contractor will then investigate the significant properties of a number of the sub-types, which are to be decided in discussion with JISC.

## **Methodology**

13. As part of the tender application the JISC will expect an appropriate methodology for conduct of the studies to be proposed. Reviewing of existing evidence provided by previous and existing relevant projects is important in meeting the studies’ objectives. Some of the studies’ objectives could be also met by for example taking a case study approach (using a number of case studies), or by iterating around an experts workshop. Consultation with the relevant communities and peer review/acceptance are important elements of conducting the studies.
14. All four studies are expected to work closely with the InSPECT project and meet and collaborate with each other wherever appropriate, to enable comparison of findings and recommendations.

## **Deliverables**

15. The contractors are required to produce a detailed report presenting the outcomes of the studies with accompanying documentation and recommendations. The reports will be reviewed by the JISC Executive and its representatives prior to acceptance.
16. The primary audiences for this work are the JISC, and managers within universities and colleges. It is anticipated that the report will be made public once it has been accepted.
17. The contractors may be required to present the findings to the JISC community at appropriate events or conferences.

## **Funding Available & Timetable**

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<sup>9</sup>. A ‘state of the art’ report will be delivered by the InSPECT project in end March, evaluating and assessing existing discussions of the concept and clearly stating an agreed working definition for the project.

18. Funding of up to £40,000 (inclusive of VAT and travel and subsistence) is available for each of the four studies mentioned above. Bidders who are eligible to apply full economic costs (fEC) to their proposals are permitted to do so, but JISC's total contribution to each study will not exceed £40,000.
19. The successful bidders will be expected to begin work in the week commencing 7th May 2007 at the latest. It is anticipated that the studies will be undertaken over a period of 5 months. An interim report will be required half way through the project, and a final report including supporting documentation on the end date. A draft final report will be required ten working days before the end of the project.

### **Format of Bids**

20. The tender proposals should clearly identify:
  - relevant experience in similar projects/initiatives;
  - the proposed methodology/methodologies to be used;
  - a detailed work plan with milestones and deliverables;
  - details on how the project will work with/build on (as appropriate) other work in this area;
  - the basis on which the fee would be calculated, broken down into different phases as appropriate and showing the relevant daily rates against each member of the team to be employed on the project;
  - the staff to be used in the main areas of work and where management responsibility for the project will rest. A single point of contact for all correspondence relating to the project should be provided;
  - confirmation that work could start by the week commencing 7th May 2007 at the latest;
  - full contact details for the project leader, including email address;
  - letters of support from an authorised senior manager at each institution/organisation named in a bid.
21. If an institution/organisation wishes to bid for more than one of the studies, separate bids should be submitted for each study. In this case, each bid should provide details of where economies of scale will be achieved by the same institution/organization undertaking more than one project.

### **Evaluation Criteria**

22. Tenders will be evaluated on the basis of the following criteria in no particular order:
  - a full understanding of the specification, including addressing the purpose and scope of the studies;
  - suitability of proposed methodology/methodologies;
  - clarity and feasibility of detailed workplan;
  - relevance of the previous experience of the tendering organisation(s) and of the particular consultants/researchers to the project;
  - analysis of risks to successful completion of the studies;
  - value for money.

### **Management of the Studies**

23. The contractor will be expected to communicate any amendments to the detailed workplan and to keep the JISC Executive informed of progress with periodic summary reports by email or telephone. The JISC Executive will also wish to have the opportunity to comment on any draft reports before they are finalised. Projects will be expected to follow JISC's Project Management Guidelines ([http://www.jisc.ac.uk/proj\\_manguide.html](http://www.jisc.ac.uk/proj_manguide.html)), including adherence to good project management practices, regular reporting and participation of projects in steering committees.

### **Intellectual Property**

24. The information provided in the studies and reports to the JISC, and the rights to all other outputs, shall become JISC/HEFCE's property.

## Bidding Guidance

25. A guide to bidding for JISC projects can be found at: <http://www.jisc.ac.uk/bidguide.html>.

## Submission of Proposals

26. Proposals of no more than six pages of A4 in no less than 10pt font should be submitted as an electronic version via email (PDF format) as one file or a zipped folder. **The deadline for submissions is 1300 hrs on Thursday 19<sup>th</sup> April 2007.** Proposals should also be accompanied by a completed cover sheet (see appendix A). CVs may be attached as appendices to the 6 page proposal and should be no longer than 2 sides of A4 each.
27. If an institution/organisation wishes to bid for more than one of the studies, separate bids should be submitted for each study.
28. Proposals **MUST** be received by the deadline which will be strictly adhered to. Faxed or late proposals will **NOT** be accepted.
29. If the bid exceeds the page limit guidance, evaluators will be advised to disregard information provided beyond the indicated page limit.
30. Each bid must be accompanied by letters of support from an authorised senior manager at each institution/organisation named in a bid. The support letters do not count towards the 6 page limit.
31. All proposals should be sent to:  
  
Amy Laws, JISC Executive, Northavon House, Coldharbour Lane, Bristol, BS16 1QD  
tel: 0117 931 7451; email: [a.laws@jisc.ac.uk](mailto:a.laws@jisc.ac.uk)
32. JISC will endeavour to notify bidders of the outcome of the evaluation process by the end of week commencing 30<sup>th</sup> April 2007.
33. The JISC reserves the right not to award a contract.

## Enquiries

34. Enquiries about this Invitation To Tender should be addressed to Helen Hockx-Yu, Programme Manager, JISC Executive (email: [h.hockx-yu@jisc.ac.uk](mailto:h.hockx-yu@jisc.ac.uk)).

**Appendix A**

**Cover sheet for proposals** *(All sections must be completed)*

**JISC ITT: Studies to investigate the significant properties of digital objects**

<b>Name of lead institution/organisation</b>
<b>Project partners (if applicable)</b>
<b>Full contact details for primary contact</b>  <b>Name:</b> <b>Position:</b> <b>Email:</b> <b>Address:</b>  <b>Tel:</b> <b>Fax:</b>
<b>Please indicate which study is being bid for:</b> i) e-Learning Objects ii) Software iii) Vector Images iv) Moving Images
<b>Length of Project</b>
<b>Project Start &amp; End Dates</b>
<b>Total Funding Requested from JISC</b>
<b>Outline Project Description</b>

