Planetarium

WELCOME TO THE OPEN PLANETS FOUNDATION

Dr. Adam Farquhar Planets Project Coordinator

It has been a real professional and personal pleasure to coordinate the Planets project over these last four years. I know that I have learned a lot about digital preservation, working with people across so many organisations and countries, and running a large scale European project. I've gotten to know some truly talented and knowledgeable people. I'm sure that the friendships and working relationships that we've built up will endure for many years. Even better, I know from Lessons Learned sessions that many of the project team share this. These sessions also showed that the project was able to deliver real value to its member organisations with widely varying goals and motivations. I would like to thank the Planets Community and all of the Planets project team – both current and past – for making the project a success.

Over the past four years, Planets has made significant advances in digital preservation. It has produced tools, services, and advances in our understanding that are already helping organisations such as national libraries and archives to meet their digital preservation challenges and provide enduring access to their digital collections.

The Planets project is now drawing to a close. Members of the Planets community and their organisations world-wide, however, have expressed a strong interest in ensuring that the results of the project can be sustained and further developed. In order to meet this need, we have established the Open Planets Foundation (OPF). OPF is an independent not-for-profit foundation that brings together organisations that share a commitment to enduring long-term access to digital material. Its primary goal is to advance digital preservation and provide practical solutions to meet the needs of its members.

The high level support for the new foundation and its international membership reflect widespread recognition of the importance of digital preservation and demand for practical solutions. OPF will provide stable hosted access to Planets services such as the on-line Testbed and preservation planning tools and enable members to build and test their digital preservation approaches before implementation. The Planets results, however, are only a start.

As part of the OPF community, members will benefit by sharing expertise and know-how in a community of experts. They will have access to technology watch reports to keep abreast of the latest digital preservation developments. OPF will also coordinate further development of the Planets services, tools, and technology by supporting and engaging the Planets Open Source community and seeking external funding for development projects. It will also provide technical support and training.

OPF is a membership organisation with subscriptions financing ongoing activity. Establishing, growing, and maintaining a vibrant membership community will be at the heart of OPF's success. External project funding will also be an important component in supporting further development. If you would like to find out more about the community or become part of the OPF, please visit **www.openplanetsfoundation.org**.

Hannah Jenkins, British Library

Bram van der Werf has been appointed as Executive Director of the Open Planets Foundation. Bram brings extensive technical and management experience to the role. He was the Technical Director at Europeana, responsible for moving it from a project and prototype basis to a robust production quality service.

Regarding his appointment, Bram said: "I am delighted to have joined the Open Planets Foundation at this exciting time, and am pleased to be able to contribute to the important and growing area of digital preservation. The Planets project has achieved notable successes and provides a solid platform on which to build tools and services to meet the needs of the digital preservation community. I look forward to using my experience to help the OPF develop its strategy and services, and to working with OPF members to support their digital preservation needs."

INSIDE THIS ISSUE

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THE USER COMMUNITY – From Planets to Open Planets Foundation

Since April 2009, the Planets User Community has grown to almost 600 members and has become an important vehicle for disseminating information and establishing a community of interest. OPF wishes to maintain the flow of information and continue to build the community in the future.

To enable them to do this we would like to pass over contact details to the OPF organisation's Board of Directors. This will be solely for the purpose as set out in the Community Terms of Participation at: **http://www.planets-project.eu/community/.** Control of the data will pass from Planets to the new organisation.

If you do not wish your membership details to be held by OPF, please send an e-mail to info@planets-project.eu with 'unsubscribe' in the subject field by 31 May 2010. You can unsubscribe in the same way after this date. If you are a member and agree to having your details passed over, you do not need to do anything.

To join the User Community, please register at: **www.planets-project.eu/community.**

NOT SUCH A RISKY BUSINESS – Making a Case for Digital Preservation

Clive Billenness is Planets Programme Manager and a registered practitioner in the management of risk. In this article he considers the case for investing in preservation of digital content and how Planets can be connected to an organisation's corporate risk management.

The Planets project team has gathered a great deal of background information about how organisations address digital preservation within their overall corporate governance structure. In addition to detailed information provided by respondents to the extensive user survey[1] (conducted in mid-2009), we have acquired a great deal of anecdotal information throughout the life of the project. This has come from delegates attending our own training conferences as well as from conversations that Planets team members have had at other events which they attended either as delegates or presenters.

One key issue that has emerged is that many organisations are dealing with digital preservation using a project-based approach – i.e. by allocating resources on a one-off basis to deal with the preservation of particular digital collections. It is far rarer to find digital preservation taking place as part of an organisation's business-as-usual activities. This is especially the case in Europe (as opposed to the US). As the volume of born-digital holdings grow, however, it is unlikely that reliance on project-based resourcing will be sufficient to prevent a backlog of material from building up. In addition, not only is there the risk that grant-based funding will fail to address an organisation's true priorities, but also that project-based initiatives will fail to provide the revenue stream necessary to sustain a digital preservation solution in the long-term.

There are also differences in opinion about what is meant by the term digital preservation. In many cases it is perceived as a passive process by which multiple copies of information are made and stored. Planets' (and the European) perspective on digital preservation is that it is an active process that involves ongoing endeavours to ensure that materials continue to be accessible.

Initial investments in hardware or specialist software will require continued technical support and maintenance, and a controlled operating environment – all of which need revenue. In addition, storage media obsolescence will occur in only a few years, meaning that fresh capital investment to migrate the preserved objects to a new medium will be required within a relatively short time, even if the format in which the digital objects are held remains current.

It is therefore important to shift digital preservation from a predominantly project-based activity to inclusion within an organisation's normal risk management activities. This will ensure that preservation actions are planned, prioritised and executed as part of an overall corporate strategy.

For almost 20 years, all organisations with a duty to shareholders or the taxpayer have been required to operate within a corporate governance framework. These frameworks impact every aspect of both management control of the organisation and the stewardship of its assets. From the Cadbury Report[2] in the early 1990's to the Sarbanes-Oxley Act[3] in the USA, the duties of care imposed on directors of organisations have increased steadily – and in the light of the recent global financial crisis, this burden is likely to increase even further in the future. In some cases, digital preservation activities may actually form a core element of an organisation's arrangements for compliance with its legal obligations to retain personnel and financial records for periods of time which could be as long as 60 years where a time limit is specified (some records are required to be retained 'permanently').

Despite this, it is unlikely that risks relating to the preservation of digital records feature heavily in most organisations' corporate risk register. Readers might like to review the register in their own organisation to see whether digital preservation is even mentioned.

The Planets Interoperability Framework offers a means to undertake digital preservation in a manner which conforms with best practice in risk management. It creates an opportunity for organisations to incorporate digital preservation with their existing corporate governance framework.

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[1] http://www.planets-project.eu/market-survey/reports/docs/DT11SurveyReportV_FINAL_19.10.09.pdf
[2] http://www.ecgi.org/codes/documents/cadbury.pdf
[3] http://www.soxlaw.com/index.htm

The standard risk management cycle involves:
- Identification of risk(s)
- Assessment of the impact and probability of a risk occurring as well as its 'proximity' – i.e. how soon is it likely to occur
- Evaluation of possible responses to the risk and deciding on a response, which might include 'retaining the risk' – an informed decision to take no action at present to prevent or reduce the risk, apart from possibly making contingency plans in case it actually occurs.
- Planning the response to the risk
- Implementing that response and confirming the outcome
- Updating and reviewing the risk register based on the response adopted.

Identify Risk

Assess Risk

Plan and Evaluate

Implement Plan

Update and Review

This cycle is repeated either at regular intervals or when triggered by a new event – for example the availability of a new preservation technology, a change in an organisation's policies and corporate objectives or the discontinuation of software support for a data format currently being used by the organisation.

Planets provides tools and services which can be used at each stage of this risk management cycle.

Risk identification and assessment can be performed using the Plato preservation planning tool, supported by characterisation services and the Planets Core Registry to assist in collection profiling and the detection of errors and corruption within the collection.

Plato also assists with the structured evaluation of possible responses to the risk, using the Planets Testbed to perform and compare the outcomes of multiple preservation action workflows. These can then be assessed using user-specified and weighted factors including the organisation's policy considerations, technology employed, costs of adopting a particular solution and the accuracy of the outputs created compared with the error rate which the organisation is willing to accept. Once a decision has been taken, Plato keeps a full record not only of that decision but also of the options discounted and the data which informed those decisions.

When a particular preservation action strategy has been selected for a set of material, the Planets Interoperability Framework can be used to automatically execute the preservation plan created in Plato. The plan can contain complex workflows, harnessing many different preservation tools (potentially in many different locations), including emulation software, to transform digital objects to their final format. The plan can also be exported from Plato as an XML document to be used as a preservation script for any other digital preservation system.

Risk management is a cycle. It is therefore important to establish arrangements to review the risk plan in response to new or changed circumstances. Plato caters for this by enabling plans to be reviewed as new risks arise or changes occur in the business or technical environment. Connected to a Preservation Watch service (several of which now exist); the plan can be reviewed whenever a new alert which might affect it is received.

Because Planets conforms to the risk management process which organisations should be using in relation to other aspects of their corporate governance, and provides comprehensive documentation about each stage of the process, it is possible to incorporate it into a wider risk management process. This should enable digital preservation to take its proper place within an organisation's risk management activities and be assessed and prioritised as an integral component of the organisation's overall approach to risk, and not simply be addressed on a piecemeal basis when some funds happen to be available or a particular collection attracts a donation.

SPOTLIGHT ON: FINAL RESULTS OF PLANETS

In the final 'Spotlight on', this article reviews the results of the project. It looks at some of the key digital preservation issues that Planets has set out to address and highlights the research and development outputs that have helped achieve these goals.

How to plan

Formulation of high-quality, cost effective plans is the first step in preserving a collection of digital objects. The process is currently a manual one that requires technical expertise and adequate knowledge about organisational (business specific) requirements to identify the specific issues that arise within a collection and select an appropriate solution.

An important goal has been to develop a methodology and means to support and automate preservation planning. This has been achieved conceptually by building a preservation planning model and technically by developing the software tool, Plato. Plato has integrated tools for measuring the effectiveness of characterisation and preservation actions. It helps organisations create plans with considered preservation strategies for specific types of digital objects tailored to meet organisational requirements. By using Plato as part of a continuous process of evaluation and review, a knowledge base can be built up which provides organisations with a solid basis for making decisions about maintaining their digital objects over time.

A natural extension would be to establish a model for preservation planning and execution, based on the experience gained in Planets, as a basis to propose extensions to the OAIS reference model (ISO14721:2003).

Understand digital objects

Understanding the technical and intellectual characteristics of digital objects is essential to maintaining long-term access to them. Defining objects with sufficient granularity to enable an understanding of requirements supports preservation planning. Allowing comparison of properties between source and target objects to assess and validate the authenticity of the results supports preservation actions. Planets has sought to develop methodologies, tools and services to automate these processes.

Though the definition of an eXtensible Characterisation Description Language (XCDL[4]) a methodology has been established to describe the significant properties of digital objects. The eXtensible Characterisation Extraction Language (XCEL) has established a method for describing how significant properties are encoded within specific object formats and may be extracted as XCDL descriptions. The file characteristics ontology defines the file

format properties and the relationship between them and supports this work.

Work has been carried out to evaluate and develop characterisation tools. This includes a tool evaluation report, a deployable tool interaction framework to allow Planets characterisation tools to interoperate and be delivered as services within the Planets interoperability framework, and ongoing tool builds for extractor and comparator tools.

The Planets Core Registry, which has been designed, built and populated within Planets, provides technical information about file formats, software products and other technical components to support characterisation services.[5]

The project has also investigated emerging characterisation technologies and techniques leading to white papers reporting on the state-of-the-art in the field of Representation Information Repositories and documentation of the relationship between the XCDL / XCEL specification and XML based office formats. Reports will be delivered on the state-of-the-art in the field of digital object properties, a Planets-wide ontology and a case study on obtaining and relating digital object properties.

Together with research papers and reference sources, automated tools will inform and demonstrate how characterisation techniques can be applied practically to real-world digital collections.

Test tools and workflows

The project has recognised and sought to address the need to create a controlled environment in which scientific experiments can be conducted to ascertain the suitability of individual preservation services or more complex workflows created in Plato.

The Planets Testbed makes this possible in the form of an easy to use web interface integrated with the Planets Framework. The software standardises the way in which experimental results are described and so makes it easy to exchange evidence about preservation actions. A corpus of over 5,000 digital objects annotated with verified properties and characteristics can be used to validate and benchmark the outcomes of preservation processes.

The centralised Planets Testbed service (http://testbed.planets-project.eu/testbed/) entered public beta in February 2010 and is available to the wider preservation community to access the corpora

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[4] http://www.planets-project.eu/docs/reports/Planets_PC2-D7_FinalXCDLSpec_Ext.pdf
[5] http://www.nationalarchives.gov.uk/PRONOM/Default.aspx

and experiment with the tools and services developed by the Planets project[6]. This central service automatically pools the results from experiments, acting as a rich source of data about preservation actions which can be used to inform preservation planning[7].

Preserve content

Preservation action tools are the core components of the Planets digital preservation solution.

The project has recognised two main approaches to digital preservation; the modification of the object (through migration) and the modification of the environment (through emulation).

Planets has aimed to research most commonly used file formats, make available tools to preserve them, develop new tools and research emerging preservation strategies.

The Planets' Gap Analysis[8] investigated the most commonly used file formats in digital archives and repositories and compared these with an inventory of tools in use. The main conclusions were that: migration tools exist for common file formats; the user or provider community is able to handle problems arising from new versions of niche file formats such as Daisy (audio books for blind and vision impaired people) and tool requirements vary by organisation.

Migration tools to deal with the most common formats have been wrapped in Planets to enable their use within Plato, the Testbed and the Planets framework. Planets has also developed and made

available emulation tools Dioscuri (an x86 emulator written in JAVA), GRATE (remote emulation solution) and Universal Virtual Computer (UVC). Guidelines[9] are in place and set out requirements for integrating third-party tools into the Planets framework.

The researched preservation action tools are described in the newly developed Planets Core Registry (PCR) which contains information about file formats, software and hardware and makes connections

between the three. In the PCR, pathways are described in terms of the steps that lead to a preservation action. For example, the pathway describes a migration action by connecting an input file format, a tool and an output file format. This information is available for general browsing, as well as through web services. Research into emerging preservation techniques is described on page 11.

Distributed access to tools and services

Central to Planets was the ambition to build a service-based infrastructure for discovering preservation tools and executing those tools within preservation workflows.

The Planets architecture has advanced the cause of digital preservation by providing a platform for interoperable preservation tools. The Interoperability Framework is the technical backbone that integrates digital preservation services (such as migration or characterisation) registries (for formats, services, technical vocabulary, and Planets Digital Objects), and workflows for the preservation of different types of digital data developed in Planets. The Framework is the foundation for preservation applications such as the Testbed and the planning tool Plato. It also provides standard software components such as authentication and authorisation, notification and logging, and data / metadata management.

The Planets service interfaces and a digital object model are among the key technology outputs of the work. These service interfaces, the digital object model, and defined communication protocols enforce a technical contract and semantic interoperability between the various services of a preservation workflow and within the Planets preservation system. Preservation tools that are provided based on these service interfaces can easily be registered with a Planets instance and immediately used within Planets workflows. The service interfaces and their application are documented in the Service Developers Guidelines[10].

The Planets Framework provides an infrastructure to carry out digital preservation actions in the form of service-based workflows. Making use of the Planets framework, preservation tool suite and workflow templates, can save an organisation effort, time, and money by basing preservation workflows on existing best practices, or by re-using existing preservation patterns[11].

Future research and development will address scalability in preservation workflows; in particular, how to handle very large objects, complex objects, and large numbers of objects within a given workflow.

[6] http://www.planets-project.eu/docs/testbed-documentation/Planets_Testbed_User_Guide_for_TBv1.1_v1.pdf
[7] http://www.rinascimento-digitale.it/eventi/conference2009/proceedings-2009/schlarb.pdf and http://journal.code4lib.org/articles/83
[8] http://www.planets-project.eu/docs/reports/PA2D3gapanalysis.pdf
[9] www.planets-project.eu/docs/reports/PA2-D2_Blueprint_Preservation_Action_Tools.pdf
[10] http://www.planets-project.eu/docs/reports/Planets_IF6-D3_Service_Developers_Guidelines.pdf
[11] http://www.planets-project.eu/docs/reports/Planets_IF5-D1_Creating&Install_IF_Pres_Workflows.pdf

Stimulate demand

Technology is only valuable in as far as it meets real or anticipated needs. Planets dissemination and take-up has aimed to raise awareness about the need to preserve digital content, build a community of interest and stimulate take-up of tools and services.

Research has been undertaken into attitudes towards digital preservation and market requirements. This has included a survey[12] of 200 organisations world-wide and series of 18 briefings with suppliers and vendors. It has also included in-depth quantitative and qualitative research with academics at the Universities of Aarhus and Glasgow and with civil servants in Flemish and Dutch governments. Findings are documented in http://www.planets-project.eu/docs/reports/Reportonacademicresearchpractices.pdf and www.planets-project.eu/docs/reports/Planets_DT7-D4_Questionnaire_Report.pdf.

Planets partners have presented results at over seventy international conferences including annual ECDL, JCDL and iPRES conferences and Planets has been an active contributor to WePreserve annual events. It has also delivered nine customised workshops. Most recently, Digital Preservation – The Planets Way has made information and hands-on training in digital preservation and Planets available to almost 250 people. This is now widely available at http://www.planets-project.eu/training-materials/. See p 9.

Following the launch in April 2009, the user community has grown by 20 members per month to 570[13]. Planets is now being integrated at the State and University Library, Denmark, National Archives of The Netherlands, British and Austrian National Libraries and the results documented in four case studies. Work has also begun to extend awareness beyond the core community. The deposit of the Planets TimeCapsule at Swiss Fort Knox on 18 May 2010 aims to promote widespread awareness of the issues among the general public. See p9 to find out more.

Final public releases of the Planets Software Suite will be available on two new Planets SourceForge sites. Previously, releases have been made available on the project GForge server, hosted by Humanities Advanced Technology Institute (HATII).

These two sites will be of particular interest to service developers who wish to integrate Planets within existing repositories and digital library systems or who wish to develop or wrap tools within the Planets Framework.

LAUNCH OF PLANETS TECHNOLOGY
Final Public Release of the Planets Software Suite v1.0

Carl Wilson, British Library

The Planets Suite site

http://sourceforge.net/projects/planets-suite/
The Planets Suite site contains the Open Source code produced over the lifetime of the Planets project. It consists of three main software components: the Planets Interoperability Framework, Plato and the Testbed [see Spotlight On article on pages 4–6].

As well as the source code there will be a binary installation package, which will install the Planets main software components and a set of core, Open Source, Java services such as DROID (Digital Record Object Identification tool) and the ImageMagick migration tool. For a full list, please see the Planets Product Specification: http://www.planets-project.eu/docs/comms/PLANETS_PRODUCT_SPECIFICATION.pdf.

The JavaDoc for the Planets software components will also be available from SourceForge to assist developers wishing to create services or workflows.

The Planets Contributors site

http://sourceforge.net/projects/planets-contrib/
The Planets Contributors SourceForge site provides a place for third party developers to become involved with the Planets community. Digital Preservation services, and workflows, can be developed here, separate from the core services on the Planets suite site and API (Application Programme Interface) development. This allows developers to experiment with the code and share ideas with other developers.

Supporting documentation

Lastly there will be a set of supporting documentation, which will be available on the Sourceforge website:

- Service Developers Guidelines
  http://www.planets-project.eu/docs/reports/Planets_IF6-D3_Service_Developers_Guidelines.pdf
  A how to guide for developers wanting to create digital preservation services that are compatible with Planets. The document has code examples and best practice guides for wrapping digital preservation tools so they can be invoked from within the Planets software.

- Guide to Using Planets Digital Objects
  A practical guide to using the Planets data registry, digital object managers (adapters between Planets and repositories) and digital objects (files and their metadata). It consists of examples and best practice, which can help ensure efficiency during data transfer. It also describes different mechanisms for storing data provided by the Planets Interoperability Framework.

- Workflow documentation
  Documentation to explain how Planets' digital preservation services integrate with the Workflow Execution Engine, which supports a programming model that has been specifically designed for the development of complex preservation processes. It shows how to create Planets Workflows and templates, and how to call Planets services from Workflows.

PLANETS IN ACTION: INTEGRATING PLANETS IN ARCHIVES AND LIBRARIES: Case Studies to illustrate practical use of Planets in National Institutions

Emily Nimmo, HATII at the University of Glasgow

Planets is now being used in a number of Planets Consortium institutions to preserve their collections. This work is being documented in a set of four case studies. Each case study consists of a film or concise written report demonstrating Planets capabilities and relevance to digital preservation in real-life settings.

The British Library and Migration of Nineteenth Century Newspaper Collections

The British Library has one of the top six collections of newspapers in the world. However, newsprint is fragile. To prolong the life of the collections and widen their availability, the British Library, with funding provided by the Joint Information Systems Committee (JISC), has digitised two million pages of British Newspapers 1800 – 1900 and made them accessible online[14]. The first case study is a film and documents the British Library's use of Plato to validate a preservation plan that will keep down storage costs and ensure images of the newspapers meet future needs.

The National Archives of The Netherlands and Emulation of Dutch Government Records

The National Archives of the Netherlands has constructed a Digital Depot to receive and store digital information produced by the Dutch Government. Migration is not an option for preserving some types of content such as Government databases. Consequently, NANETH has committed to emulation based preservation strategies. This case study outlines emulation strategies NANETH envisages implementing within the digital depot, including use of Dioscuri and Grate. It also describes the role of emulation as an intermediate step in migration.

Profiling The Folklore Archives at The Royal Library, Denmark

The Folklore Archive of Denmark recently merged with the Royal Library and there was a need to understand what was held in the Folklore Archive digital collection, before being stored in a long-term archive. The digital collection includes audio, video and images. This case study describes the work done by the Folklore Archive to profile their digital collection using Planets characterisation tools, and to produce a preservation plan using Plato, identifying any necessary actions to be taken on the digital collection items.

Integration of Planets with Fedora at The State and University Library, Aarhus, Denmark

The State and University Library houses the national media and newspaper collections and is running digitisation projects on these collections. The library is developing a DOMS (Digital Object Management System) repository based on Fedora Commons and participates in the Fedora community, where they develop extra functionality to be used in DOMS.

Fedora does not provide all the digital preservation functionality required by the library, such as characterisation. This case study describes the integration of Planets with Fedora to enable the library to characterise its collections.

The case studies will be available from the Planets (http://www.planets-project.eu) and the WePreserve (http://www.wepreserve.eu) website from summer 2010. The filmed case study can be seen on the Planets website at http://www.planets-project.eu/audio-visual/ and on the WePreserve YouTube channel (http://www.youtube.com/user/wepreserve).

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[14] Online access to the British Newspapers 1800 – 1900 at http://newspapers.bl.uk/blcs/

NEWS ROUND UP

DIGITAL PRESERVATION – THE PLANETS WAY AVAILABLE ONLINE

Free Planets training materials based on the Digital Preservation – the Planets Way events are available online. The online training materials provide an accessible introduction to the Planets approach to digital preservation through a:

- Series of narrated presentations providing an introduction to digital preservation, the case for investing in preservation to reduce risk and the main features of Planets tools and services.

- Set of technical summaries, produced in conjunction with Planets industry partner IBM, providing an overview of Planets tools and services for technical support staff and developers.

- Online tutorial and workbook to guide users through the Plato preservation planning tool.

- Annotated reading list of useful related resources.

The materials make the Digital Preservation – the Planets Way training widely available to anyone who missed out on attending one of the workshops or as a refresher for delegates who attended the events.

Introduction to Digital Preservation:
Why Preserve? How to Preserve?

Dr. Ross King
Austrian Institute of Technology

To start your Planets training, visit
http://www.planets-project.eu/training-materials

PLANETS TIMECAPSULE PUTS DIGITAL OBJECTS TO THE TEST OF TIME

Planets and high security data storage vault, Swiss Fort Knox (SFK), joined forces to deposit a TimeCapsule that drew widespread public attention to the need to preserve digital content for the long-term

The Planets TimeCapsule contains a set of at-risk digital objects converted into accessible formats stored on a variety of media such as punch cards, paper, floppy discs, CDs, DVD's, USB, HDDs storage with their readers and PREMIS metadata descriptions. It illustrates the fragile nature of digital content and challenges associated with preserving it over time.

Science and technology journalists from Consortium member countries in Europe were invited to attend the TimeCapsule deposit at Swiss Fort Knox, in Saanen, Switzerland on 18 May 2010.

Adam Farquhar, British Library and Andi Rauber, Vienna University of Technology.

Andi Rauber, Associate Professor at the Department of Software Technology and Interactive System, Vienna University of Technology (TU-Wien) and architect of the Planets / SFK TimeCapsule said:

"Digital media are vulnerable to decay and obsolescence. While data stored on physical media may last hundreds of years, data stored in digital formats may not be read in tens of years' time."

Swiss Fort Knox will house the primary Planets TimeCapsule for retrieval at specific intervals e.g. every 10 or 20 years. The TimeCapsule contents will be available to students and researchers for experimentation via a virtual TimeCapsule. Libraries, archives and science museums will be able to hold copies of the TimeCapsule for reference and to use for public exhibition.

To find out more, read the TimeCapsule press release, track progress and download images, please visit the Planets TimeCapsule web-site at:
http://www.ifs.tuwien.ac.at/dp/timecapsule/
or follow us on Twitter at: https://twitter.com/TimeCaps.

Watch the exclusive report by Reuters TV at:
http://www.reuters.com/news/video/story?videoId=88979667&videoChannel=6

Additional press coverage can be seen at:
http://www.reuters.com/article/idUSTRE64H4GE20100519
http://www.wired.co.uk/news/archive/2010-05/19/'digital-genome'-used-to-safeguard-future-access-to-data
http://www.redorbit.com/news/technology/1867455/project_aims_to_preserve_data_formats/
http://itn.co.uk/8683a7aa1107f56fe382d71979b4e149.html

EVENTS AND PUBLICATIONS

Final training event reaches Rome

Despite widespread travel difficulties across Europe due to the eruption of the Icelandic volcano, resulting in airspace being closed, almost half of the delegates still found alternative means of travel to attend the final event in the series of 'Digital Preservation – The Planets Way' in Rome. Those delegates who were unable to attend this course because of the travel disruption were offered places free of charge at the final Planets event – an open All-Staff Conference held in Berlin on 20 May 2010.

One recurring positive comment which delegates have made about every Planets training course has been that they were pleased to see the inclusion of case studies about the application of Planets tools and services by partners. The Rome event was no exception as Ross King, Austrian Institute of Technology demonstrated how the Planets Framework was applied within a 'real' digital preservation project at the British Library – a project to migrate existing digitised 18th Century Newspapers. He explained how the Planets Framework had been connected to the British Library's repository services to successfully complete this application of the Planets toolset.

Following this, Barbara Sierman, National Library of the Netherlands, explained how it was envisaged that Planets tools would be integrated within their forthcoming project to replace their existing digital repository system (e-Depot). She also demonstrated how the Functional Model which underpins Planets is compatible with the OAIS model.

When asked what they had liked best about the conference, delegates commented:

"The practical exercises were the best."

"I liked the opportunity to meet other people interested in digital preservation and see the Planets suite used in real-life scenarios."

A number of delegates throughout the events have indicated that they would like the Planets team to come to their country and provide a repeat course for colleagues. While this cannot be undertaken within the Planets Project, it is anticipated that its successor, the Open Planets Foundation, will provide regular training courses around the world on a regular basis

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Digital Preservation Roadshow, Society of Archivists, 15 February 2010 at Cardiff, UK
'Introductory Briefing to the Planets Project'
Clive Billenness (The British Library)
Presentation:
http://www.archives.org.uk/resources/billenness_dproadshow_l.pdf

Publications

'Save your databases!'
Ursula Mayer (The Swiss Federal Archives)
Conference paper and presentation at ECA 2010, 28-30 April 2010 in Geneva, www.bar.admin.ch/eca2010/index.html?lang=en

'The risky business of digital preservation – the application of risk models to digital file format obsolescence'
Ross Spencer (The National Archives)
Conference paper and presentation at ECA 2010, 28-30 April 2010 in Geneva, www.bar.admin.ch/eca2010/index.html?lang=en

FUTURE DIRECTIONS IN DIGITAL PRESERVATION

Andrew McHugh, Innovative Research and Development Manager, Humanities Advanced Technology and Information Institute (HATII), at the University of Glasgow reviews efforts to explore emerging preservation approaches and opportunities that provide a platform upon which future digital preservation research and activities may be based.

Planets has developed a suite of preservation tools and methods capable of satisfying most mainstream preservation challenges within library and archival environments. It has also introduced an integrated, coherent and widely applicable approach to digital preservation. However, some information contexts have unique demands that cannot be satisfied using a default core toolset. Digital preservation is a dynamic discipline and the techniques and capabilities must themselves evolve to reflect emerging opportunities and anticipated future challenges. This is reflected in most aspects of Planets research and development in preservation planning, characterisation and validation.

Planets has been exploring opportunities for alternative strategies that may be better equipped to deal with the preservation of niche or emerging digital content and which will provide a foundation for future research into digital preservation technologies. Currently there are two primary preservation strategies: migration, the conversion of data into current or more widely accessible formats, and emulation, the use of modern hardware and software to recreate an old computing environment and access old, obsolete files using original, possibly obsolete, software.

Migration works well for static materials, such as documents and images, where content is easily distinguishable from the functional environment within which it is represented. It is, however, lossy, guaranteeing the preservation of only those properties identified as significant at the point of migration. Migration is seldom a viable approach for interactive or dynamic materials. Its scalability may also be viewed with some scepticism. For things like software applications, video games and new media art, emulation is considered more appropriate. Emulated infrastructures are scalable to support potentially many legacy materials. However, they are themselves sensitive to obsolescence. If not well-managed, one might be required to rely on stacks of emulators to maintain access to legacy preservation infrastructures in order to access original materials. Likewise, emulation implies that access is available only within the confines of an emulated application – user interfaces may therefore become obsolete and data flow between contemporary and emulated environments difficult or impossible.

An alternative strategy is binary translation. At HATII, Planets is experimenting with binary translation to determine whether, despite its technological complexity, it is a feasible strategy to add to the preservation practitioner's armoury. Binary translation may be considered as a type of migration; source program instructions are statically or dynamically converted to an equivalent but compatible form in a new target environment. This approach enables the execution of non-native (i.e. legacy) software code on contemporary hardware and software platforms. A popularly cited application is Rosetta, which runs on Apple Mac computers, and dynamically translates PowerPC compiled software to run on newer Intel based Mac platforms. Access is integrated and, in principle, is seamless. Additional research is seeking means for evaluating and validating preservation that focus on performative or experiential information properties.

Database preservation is also a fundamental priority in Planets. One in two organisations that create databases needs to hold them for the long-term. This is expected to increase to almost 85 per cent in ten years' time. Planets partner, the Swiss Federal Archives, has developed the Software Independent Archiving of Relational Databases (SIARD[15]) suite to enable preservation of relational databases. SIARD provides a migration solution for databases, enabling the export and import of database content between a range of source and target relational database management systems. Planets is now considering wider questions implicit in database preservation. How might the temporal aspects of live and dynamic databases be approached, where scalability is evident not only in the creation of new rows, but also the variability of existing entries? Citability of databases is becoming a critical consideration given the increasing role of database stored content as evidence in a range of academic, scientific and legal contexts. Referential difficulties are a natural consequence of data evolution over time. Functional characteristics that are implicit within the data itself, such as stored procedures, also pose difficult problems. Nevertheless, they are potentially integral to the record, and to its future interpretation and reusability, and infrastructures must be capable of accommodating them persistently. The National Archives of The Netherlands is undertaking work to determine the suitability of legacy database preservation policies and approaches in light of the tools, techniques and attitudes that frame the contemporary view of database preservation.

A further area of emerging importance is the smaller scale archival environment, which among other things encapsulates personal digital collections. Non-expert users are less equipped to approach the preservation challenge which, experience tells us, is large, complicated and costly. Led by work at the Vienna University of Technology, Planets is developing HOPPLA (Home and Office Painless Persistent Long-term Archiving), an application intended to alleviate preservation responsibility from those who have custody of valuable at-risk digital content. HOPPLA provides streamlined automation of the preservation process in a similar way to personal anti-virus software. Services are handled in an intuitive user-friendly interface with minimal exposure to technical complexity. Logical preservation is automated by reference to established best practice, and backups across multiple storage media offering further end user reassurance. Visit http://www.ifs.tuwien.ac.at/dp/hoppla/ for more information.

[15] http://www.planets-project.eu/docs/presentations/ICA2008_Comment_SIARD.pdf

A final novel area that Planets is investigating relates to automating the process of monitoring and executing preservation itself. This is specifically focused on the development of context-aware digital materials. Within a context-aware object preservation system, particular combinations of system and object status characteristics prompt preservation interventions from an overarching management system. This implies an active object, contrasting with our usual understanding of digital materials as passive players subject to risks prompted by technological, organisational and other contextual factors. A dynamic, ever changing context demands similarly responsive and reactive preservation infrastructures. Likewise, because of the diversity of materials requiring varied levels of preservation, there needs to be suitably low level preservation planning capable of identifying and reflecting the factors distinguishing individual objects. By embedding at least part of the logic for preservation response within objects themselves it is hoped that these twin goals of preservation agility and granularity can be satisfied. The work, led by the University at Cologne, and The State and University Library, Denmark, is exploring a cutting edge and hugely innovative preservation approach that if successful will provide opportunities for automation, and may be tremendously influential across the whole preservation landscape.

Conclusion

Technology is enabling us to create ever more complex digital objects which are connected so intimately with their environment that it may be very challenging to preserve all the aspects of their nature for long term access. Research on digital preservation is continuing to expand and explore new and increasingly complex challenges identified and emerging technological approaches to address them.

BACKGROUND TO OPF

The Open Planets Foundation (OPF)[17] provides technology, advice and on-line services that enable its members to recognise and address threats to their valuable digital content.

Members benefit from access to stable hosted online preservation services that make it possible to assess preservation needs, build evidence-based plans and execute and validate them taking advantage of Planets and third-party tools and services.

The entire suite is provided as a single package with wizard-driven installation. Planets software uses well established J5EE-compatible components and is compatible with key standards.

Members benefit from new developments and participation in the growing OPF community that brings together experts at some of the most prestigious research, technology and memory institutions in Europe.

To find out more, visit: http://openplanetsfoundation.org/details/

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