DigitalPreservationCoalition

Digital Cultural Heritage Roadmap Project

Preservation strategies for digital cultural heritage

Part One: Cultural Heritage and Digital Preservation
Part Two: Challenges for the future
Part Three: The DCHRP Roadmap

@williamkilbride

Part One: Cultural Heritage and Digital Preservation

Digital resources are extraordinarily flexible and surprisingly fragile…

… what need we do to ensure that our generation's digital creativity becomes a meaningful digital legacy for the next?

DigitalPreservationCoalition

Digital Preservation make bleak reading:

a game we can all play

<Enter your details here>

.....

.....

.....

@williamkilbride

www.dpconline.org

DigitalPreservationCoalition

What's the problem?

Obsolete media
Obsolete software
Obsolete wrappers (file formats)
Bit rot
De-synchronisation
Poor representation information
Lack of funding
Loss of rights
Encryption and security
Physical loss (fire, theft, flood …)
Virtual damage (malware, …)

etc …

DigitalPreservationCoalition

Digitization and Digital Preservation

Digital Cultural Heritage

Access and engagement
Surrogacy
Crowdsourcing
Comparison
Etc …

But …

Sustainability
Syncrhonization
Technical obsolescence
Maintenance
Etc …

DigitalPreservationCoalition

Preservation policies in digitisation

18 questions…

Who →
- are your users long and short term?
- maintains the intellectual integrity of the content?
- maintains the technical integrity of the content?

What →
- is the content and where did it come from?
- formats and metadata do you use?
- is the size of the collection?

Where →
- is the master copy of the metadata?
- is the master copy of the principle content?
- are other copies held?

When →
- How long do you expect content to be available for?
- (if) things go wrong what are the consequences?

How →
- will the collection be created?
- maintained?
- migrated or emulated?
- will the collection be updated ?
- Will the metadata be updated?
- do you track who did what?
- do you keep data synchronised?

@williamkilbride

DigitalPreservationCoalition

Policy needs to be funded

How much will this cost?

How much does preservation cost?

Lifecycle costs of digital objects
vs
Lifecycle costs of books
vs
Lifecycle costs of museum objects
vs
Lifecycle costs of archives
vs
Lifecycles costs of historic environment

DigitalPreservationCoalition

How much does a repository cost
Here's two I prepared earlier ...

Not a direct comparison

Archaeology Data Service

Setup:
Tens of thousands

Glasgow Museums Resource Centre

Setup:
Tens of millions?

DigitalPreservationCoalition

Assertion based on my experience:

We are able to understand and assert the value of museums, libraries, archives, heritage ...

But

We are poor at understanding and asserting the value of digital.

(Is data the new oil?)

DigitalPreservationCoalition

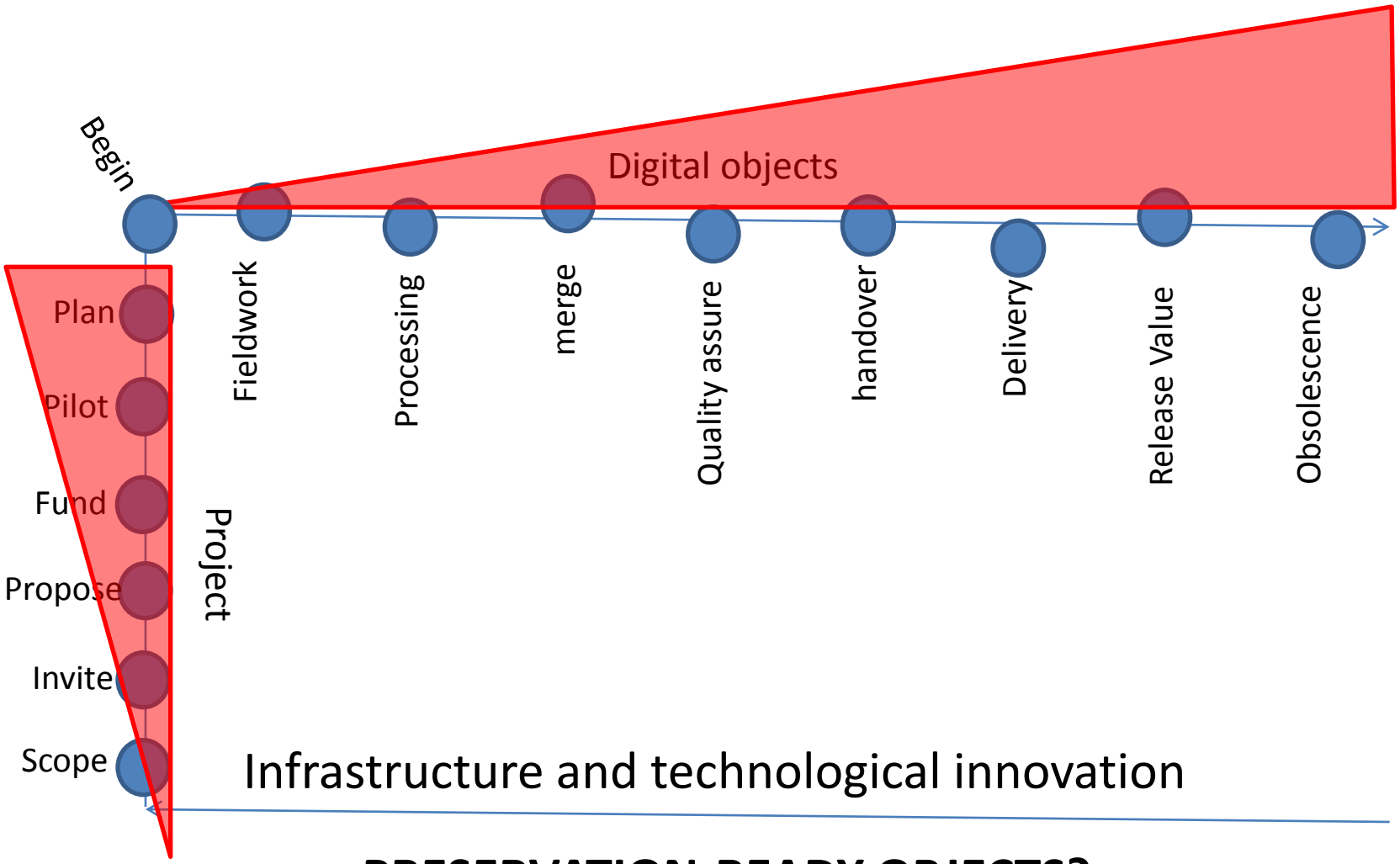
Digital preservation expensive ..?

Not necessarily: it's an unfunded mandate

Don't throw money at it:
Get the mandate properly incorporated

DigitalPreservationCoalition

When should preservation start?

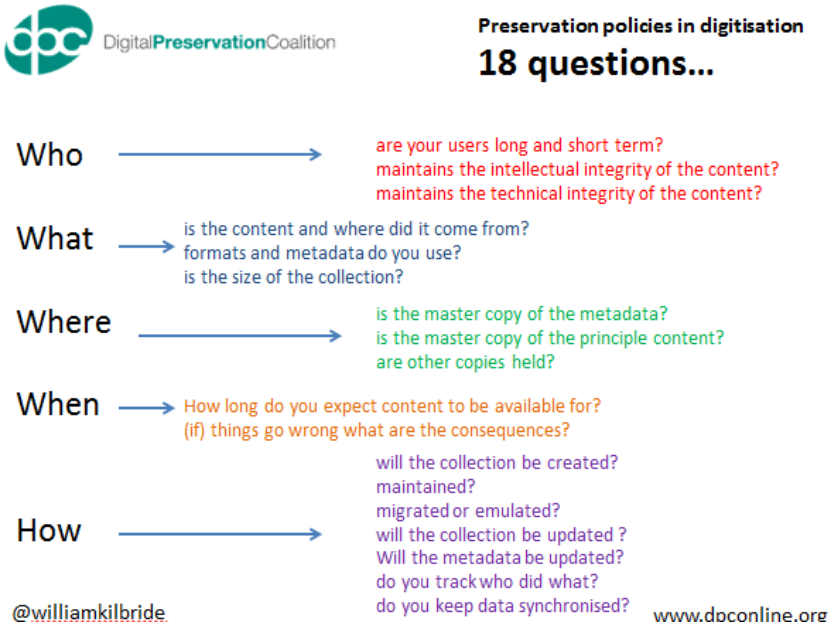


PRESERVATION-READY OBJECTS?

DigitalPreservationCoalition

Digitization and Digital Preservation

Digital Cultural Heritage



Sustainability not just technical
Sustainability not just money
Sustainability not just planning

Sustainability (also) about community

DigitalPreservationCoalition

What's the problem?

- Digital data (images, documents etc) have value
- They create opportunities

...but...

- Access depends on software hardware and people
- Technology and people change

...therefore...

- Technology can create barriers to reuse
- So, opportunities are lost

DigitalPreservationCoalition

asking the right questions

Digital preservation is not just about ‘data’:
Digital preservation is not just about ‘technology’:

it’s about

people and

opportunity

Part Two: Some thoughts in the future

The file is not necessarily the atomic unit of data. Preservation or records management approaches which fetishize files are never likely to be sufficient.

DigitalPreservationCoalition

Six (or Seven) Observations

1. **Data is growing,** budgets are not
2. Big data complex data as a metaphor for our future problems: does the cloud / GRID help?
3. Does the cloud / GRID make it **easier to engage** in digital preservation
4. Why is digital preservation **so hard**?
5. What is **data** anyway?
6. What is **trust** going to be like in the distributed world?

Does '**preservation as a service**' help?

DigitalPreservationCoalition

Data is growing on three axes

Scale

Complexity

Expectation

Capacities are not

Data volumes: 60% pa

Storage capacities: 25% pa

Data centre budgets: 2% pa

DigitalPreservationCoalition

... successful, practical digital preservation is going to be about **workflow and capacity** as much as about **obsolescence or authenticity.**

DigitalPreservationCoalition

Digital Preservation Approaches 1990-2014

Migration

- Intervention at data layer to ensure information objects
- Based on significant properties of content and performance
- Quick start, low cost, ready quality assurance, focus on data/access
- loss of authenticity, poor with complex objects

Emulation

- Intervention at software / OS layer to ensure operation of software
- Based on significant properties of the environment and its behaviours
- Slow start, high technical threshold, access less transparent
- retains authenticity, geared towards complex objects

Migration has done all the running in the last 10 years (20 years)

DigitalPreservationCoalition

Big data / complex data

Web archives

Sound and vision

Digitised content

Email

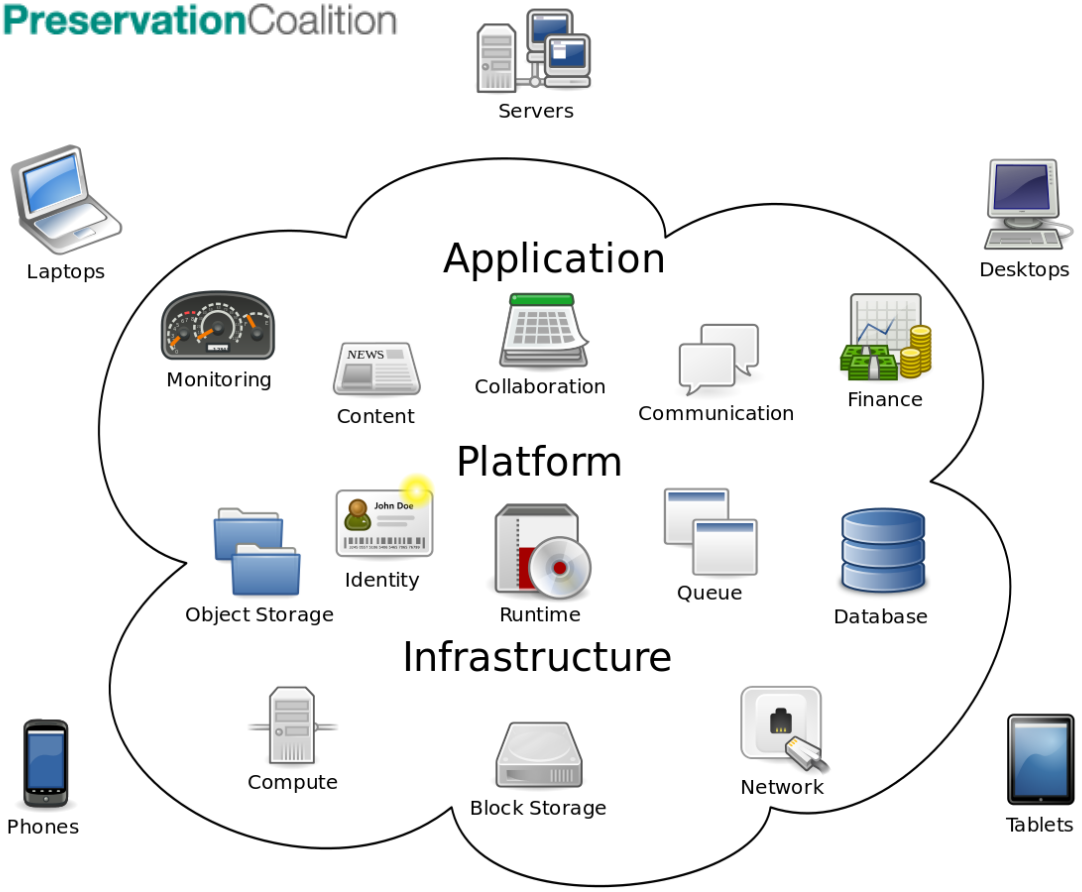
Complex, vast, valuable, heterogeneous

Difficult to move

Difficult to access

Greater than the sum of its parts

DigitalPreservationCoalition



Cloud Computing

…. the delivery of computing as a service rather than a product

Scalable and Elastic

- Services scale on demand to add or remove resources as needed

Service based

- The service could be considered "ready to use" or "off the shelf"
- Offers IaaS, PaaS, and SaaS

Economical

- Services share a pool of resources to build economies of scale
- Metered by Use : Pay-as- you- go

Evolvability

- Supports for migration and upgrades.
- Services are configurable

DigitalPreservationCoalition

Virtualization Vs Emulation

Virtualization

- Virtualisation puts a layer between physical hardware and controls access to that machine.
- Each guest machine (VM) that is built on top of the abstraction layer (hypervisor) is then provided access to the physical host's resources without modification.
- The hypervisor act as a traffic cop by allowing certain amount of the physical resources to be used by the guests, as well as manages resource sharing when more than on guest system try to access the resources.

• Emulation

- Duplication of functionality of systems, be it software, hardware parts, or legacy computer system as a whole, needed to display, access, or modify a certain contents.

DigitalPreservationCoalition

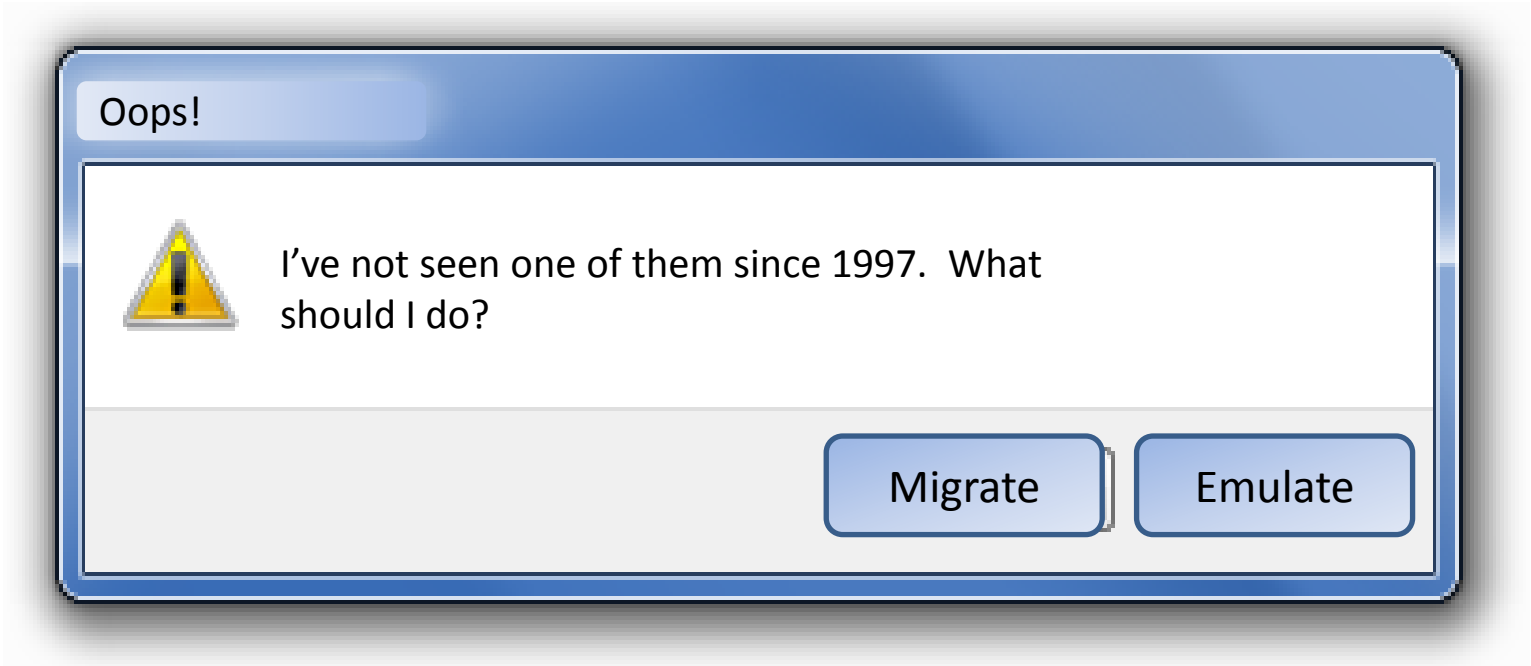
Does virtualisation make DP easier?

- Elastic
- Bypass (generic) corporate IT
- Industrial scale preservation?
- Highly dependent on services
- Pret a porter?
- Highly dependent on location and configuration of services
- Easier deployment of complex solutions – virtualisation

DigitalPreservationCoalition

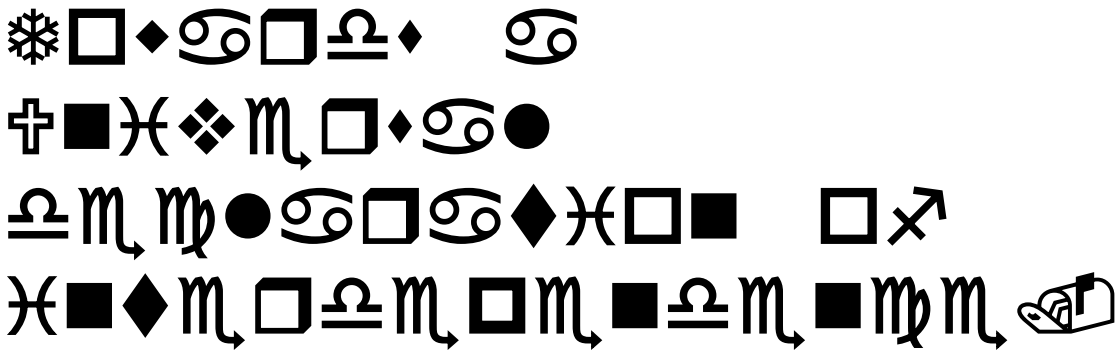
We've made this all very hard.

DigitalPreservationCoalition



DigitalPreservationCoalition

What is data any way??



or

Towards a Universal declaration of interdependence.

DigitalPreservationCoalition

From Trusted Digital Repository to untrusted digital commons

It's not the repository we trust – it never was.

the **people**, the **tools**, the **services**, the **policies**, the **business plan**, the **mission**, the **organisation**, the **context,** the **user-focus.**

How is this different?

DigitalPreservationCoalition

Can infrastructural approaches help core DP issues?

- Storage – yes!
- Compute – yes!
- Costs – maybe (maybe not)
- Skills – to some extent
- Making emulation (virtualisation) realistic?

Part three: The DCH Roadmap

Common procedures and workflows would reduce the cost in terms of time and money and would contribute to the interoperability and open-ness of data.

Existing e-infrastructures could be efficient channels for the delivery of advanced services that can be used by the digital cultural heritage sector for digital preservation.

DigitalPreservationCoalition

Core assumptions

- Digital cultural heritage collections need preservation
- Expensive and tricky to accomplish individually
- Significant economies of scale and scope are possible
- E- infrastructures (esp Grid) have proven their value in the hard sciences
- E-infrastructures are flexible and have capacity to assist

DigitalPreservationCoalition

Core challenges

- Considerable diversity in workflows in cultural heritage sector
- Skills gap in cultural heritage agencie
- E- infrastructures (esp Grid) have limited preservation experience
- How to develop trust in distributed preservation infrastructure
- How to ensure sustainability
- How to respond to other emerging technologies

DigitalPreservationCoalition

Practical actions

- Harmonizing storage and preservation practices in DCH institutions
- Facilitate dialogue between DCH institutions and E-infrastructure providers
- Understand and create the conditions in which these two sectors can integrate their efforts
- Examine and agree models for the governance, maintenance and sustainability of infrastructure

DigitalPreservationCoalition

Timescales

- Short Term (2014-5) Define topic
  - Improve interoperability
  - Harmonise storage and preservation
  - Establish cross-sector integration
  - Establish governance model
- Mid Term (2016-7) next steps
  - Enhanced data storage and preservation
  - Enhanced interoperability
  - Programme of integration
  - Redesign and implement governance
- Long term (2018 onwards)
  - Review, update, consolidate

DigitalPreservationCoalition

Audiences

Who is paying attention?

Policy makers

- Create a legal and institutional setting which makes progress possible

Digital Cultural Heritage

- Harmonise (simplify?) practice and identify priorities (eg training)

E-Infrastructure providers

- Provide access to infrastructure in trusted but simple ways

In conclusion: Some Questions

DigitalPreservationCoalition

What this means ….

Some questions?

What will success look like?

Why chose E-infrastructures over Cloud?

How will we train our staff?

How realistic is it to harmonise workflows?

How will we track and respond to user needs?

What other sorts of partnership are needed?

Where will the money come from?

DigitalPreservationCoalition

Digital Cultural Heritage Roadmap Project

Preservation strategies for digital cultural heritage

Part One: Cultural Heritage and Digital Preservation
Part Two: Challenges for the future
Part Three: The DCHRP Roadmap

@williamkilbride