



**Presto
PRIME**

KEEPING
AUDIOVISUAL
CONTENTS
ALIVE

Presto Centre: tools for audio-visual preservation

Richard Wright

BBC R&D -- PrestoPRIME

DPC – London – 8 April 2011

What I really want to talk about:

- Three kinds of digital preservation
- “preservationandaccess” = all one concept
 - Requirements for *serious* access
- PrestoPRIME tools
 - Very brief list
 - One run-through of one online tool

Why Are We Here?

- We have audiovisual content
- The 'do-nothing option' fails
- So we take preservation actions
 - Including digitisation
 - Which is expensive
 - And takes us into a new world
- Better, faster, cheaper: Presto, PrestoSpace
- The solution is the new problem: PrestoPRIME



Three Aspects of Digital Preservation

- *Making* analogue content into digital content
 - Digitisation
- *Working* with digital content
 - Digital workflow and processes
- *Preserving* the digital content
 - Digital Preservation

Three Aspects of Digital Preservation

- *1- Making* analogue content into digital content
 - Planning
 - Budget
 - Workflow
 - Standards
 - Rights
 - Result: lots of files
- PrestoSpace information online:
[//wiki.prestospace.org/](http://wiki.prestospace.org/) [//digitalpreservation.ssl.co.uk/](http://digitalpreservation.ssl.co.uk/)
- Now: revised for PrestoCentre



[Main /](#)
Preservation Guide - Introduction

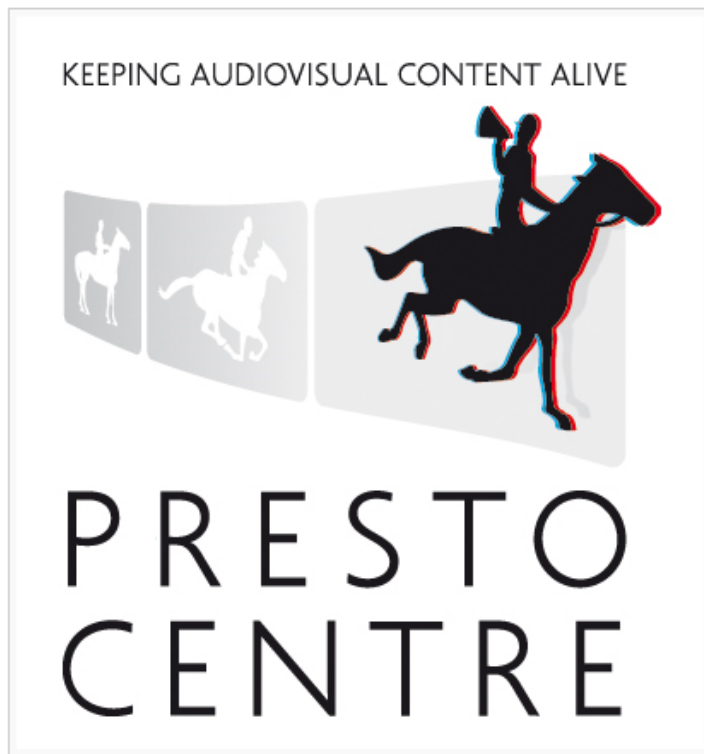
Introduction

- Overview of Preservation
- Getting Started
- Develop a Strategy
 - Collection Strategy
 - Preservation Strategy
- Make a Preservation Plan and Budget
- A Format Roadmap
- Presto Space Help
 - Effective Technology
 - Preservation Projects
- Preservation Factory
- Everything Technical
- Answers to Questions

Supplements

- The Audiovisual Culture
- Service and Storage Providers
- Future Forecast
- Presentations
- Wiki Help

Originated by the [PrestoSpace](#) project, supported by the [Cultural Heritage](#) Programme of the European Commission Information Society



Is this your problem?

If you have audiovisual media, it needs **maintenance** – or you will lose it. This guide shows how to:

- conserve old formats
- digitise for transfer to new formats
- create digital file formats

March 2011: Screening the Future 2011 ---- Major conference launching the *PrestoCentre*

[New Strategies and Challenges in Audiovisual Archiving](#)

Monday, March 14, 2011 at 9:30 AM - Tuesday, March 15, 2011 at 4:30 PM (GMT+0100)

Hilversum, Netherlands ---- Full details here: <http://prestocentre.eu/>

January 2009: New Project: PrestoPRIME It's not *Presto3* or *Son of Son of Presto* but it is related: life after digitisation. After years of digitising audiovisual content, what do we do with all those files to keep them safe, and working properly? All the answers from [PrestoPRIME](#)

March 2008: PrestoSpace Integrated Website: All the [online results from PrestoSpace](#) in one place, fully integrated! <http://digitalpreservation.ssl.co.uk/>
[The Rolling News, a pushdown list of news flashes](#)

General Guide to Audiovisual Preservation



PRESERVATION
ISSUES

DIGITISATION

RESTORATION

METADATA

DELIVERY

ARCHIVE
MANAGEMENT

TRAINING

A Web site for archive owners, academics and the public alike, which provides a first point-of-call for information on the migration and digital preservation of audio/visual works. The site is a repository of the information and experience gained in the PrestoSpace project. You will find information ranging from the tutorial to the academic on planning and executing a digital preservation project and the technologies and processes involved. You will also find training videos, management tools and links to online resources and events in the field of digital preservation.

Tutorials


[Why Digitise](#)

[Selecting your storage solution](#)

[The SAM analysis tools revealed](#)

[Training Videos](#)

[Storage Media Quality Assurance](#)

[Planning Your Preservation Project](#)

[You are not alone](#)

[Media Migration and Obsolescence in Mass Storage](#)

News

[Rollout: Vizioncore vRanger Professional](#)

Tools

STORAGE CALCULATOR

COST CALCULATOR

PRESERVATION CALCULATOR

The SAM analysis tools

Tools to help you plan and manage a digital preservation exercise

Database of audiovisual media

Common audio and video formats found in European archives

Training Videos

Videos showing how to use early videotape equipment

Events

Final PrestoSpace Workshop, Rome

See ALL the PrestoSpace technology, from new machines for audio, video, and film digitisation, to the Turnkey System for hosting your own Digital Audiovisual Archive. More than 10 different demonstrations will run simultaneously presenting the PrestoSpace technology including audio, film and video scanning tools, to tools, guidelines, and services to manage the migration process and the storage, to audio, video, and film restoration tools, and eventually the Publication Platform and the Turnkey System to give access to audiovisual contents.

Three Aspects of Digital Preservation

- 2- *Working* with digital content (lots of files)
 - Management
 - DAM/MAM
 - Repository
 - Storage
 - Metadata
 - digital library technology
 - Access
 - Rights

Three Aspects of Digital Preservation

- 3- *Preserving* the digital content
- Keeping the data 'forever'
- Coping with obsolescence
- Migration
- Emulation
- Standards: OAIS and all that
- Planning and strategy

Conservation of Analogue Content

- Handling, packaging and storing
- Environmental conditions
- Protecting the masters
- Condition monitoring

Preservation of Digital Content in *Annual Preservation Status Report*

- Handling, packaging and storing
- Handling: fixity check
- Packaging:
 - Wrapper formats
 - Encodings
 - Embedded metadata
- Storing:
 - Storage technology
 - Cost models: century store; “forever” costs
- It’s all on the PrestoCentre website

- The *social, political and economic* environment of a Trusted Digital Repository
- A lot of work has been done: TRAC, DRAMBORA
- **TRAC Criteria Documents**
 - A1.2 Contingency plans, succession plans, escrow arrangements (as appropriate)
 - A3.1 Definition of designated community(ies), and policy relating to service levels
 - A3.3 Policies relating to legal permissions
 - A3.5 Policies and procedures relating to feedback
 - A4.3 Financial procedures
 - A5.5 Policies/procedures relating to challenges to rights

- B1 Procedures related to ingest
- B2.10 Process for testing understandability
- B4.1 Preservation strategies
- B4.2 Storage/migration strategies
- B6.2 Policy for recording access actions
- B6.4 Policy for access
- C1.7 Processes for media change
- C1.8 Change management process
- C1.9 Critical change test process
- C1.10 Security update process
- C2.1 Process to monitor required changes to hardware
- C2.2 Process to monitor required changes to software
- C3.4 Disaster plans

Protecting the masters

- Analogue content needed *viewing proxies*
 - For protecting of the masters
- Digital content needs *viewing proxies*
 - For protecting the bandwidth !
- Three-level approach:
 - Master EDCine: lossless JPEG2000
 - Mezzanine: the most efficient coding for generating new proxies EDCine: lossy JPEG2000
 - Viewing proxies (could be multiple quality levels) EDCine: lower datarate lossy JPEG2000

Condition monitoring

- Analogue: check the stock on the shelves
- Digital: check the stock (test the files)
 - Fixity check
 - Beyond fixity:
 - Identification: fingerprint technology
 - Quality analysis: technical measurements on the audio and video signals contained in the files
 - AND – check the ‘shelves’: test the storage system
 - Monitoring needs cost modelling, to set a cost-effective strategy

Lots to manage !

- Lots of help from the PrestoCentre
 - Including risk and cost analysis and strategy and simulation tools from PrestoPRIME
 - and I will demonstrate one
- but first: requirements for access

Four requirements for sensible access

- Granularity
- Navigation
- Reference and Citation
- Annotation

TRANSFORMING SCHOLARLY PUBLICATION THROUGH OPEN ACCESS: A BIBLIOGRAPHY



Charles W. Bailey, Jr.

**OPEN ACCESS WEEK
23 -27 March 2009**



MLibrary

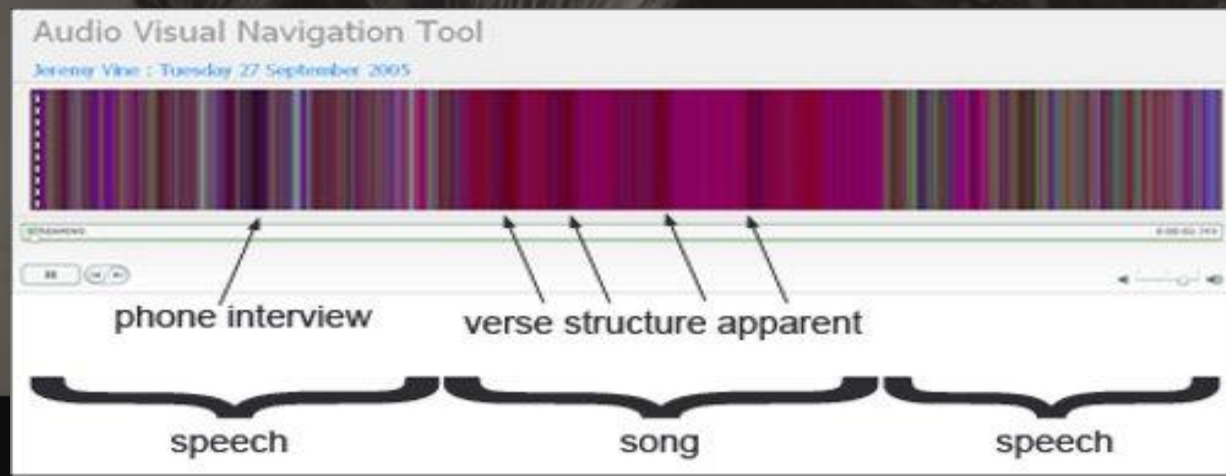


Granularity - division into meaningful units

- Keyframes
- Other methods to represent video



- and audio:



Navigation

- "Click and play" on visual representation of the meaningful units



Reference and Citation

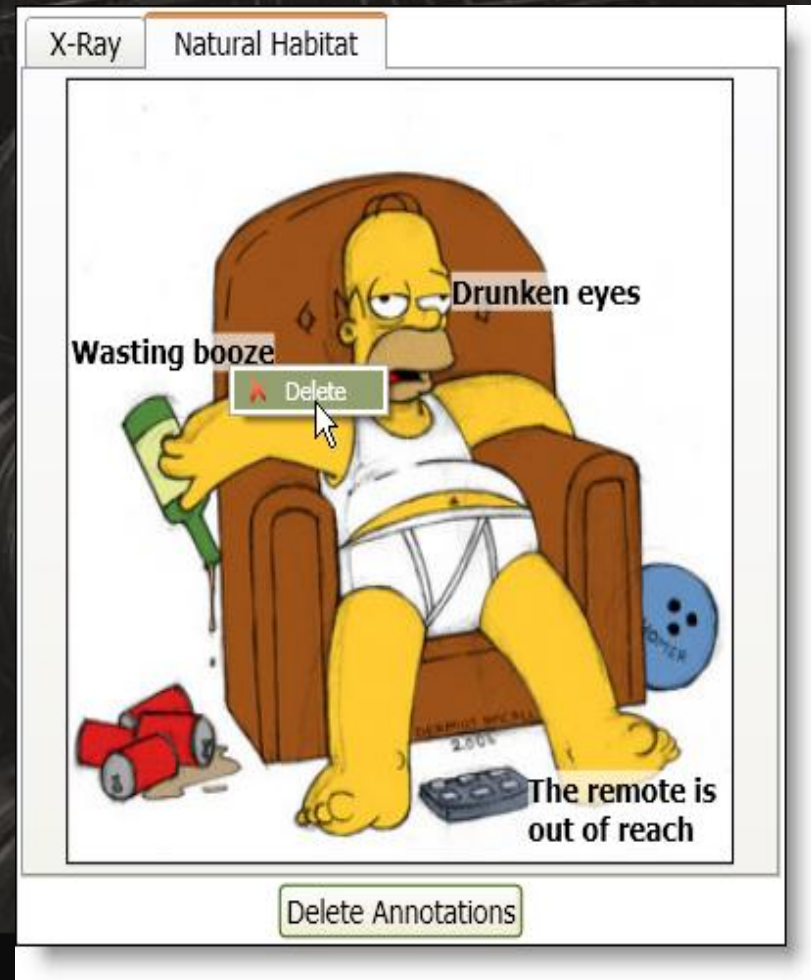
- the core requirement for scholarly discourse
 - along with a major change in attitude!
- Needs a permanent place for “things to be”
 - Hence the need for stable audiovisual collections

*“Hamlet, for example, is comparable to Saxo Grammaticus' Gesta Danorum.^[citation needed]
King Lear is based on King Leir in Historia Regum Britanniae by Geoffrey of Monmouth, retold in 1587 by Raphael Holinshed.^[citation needed] “*

wikipedia

Annotation

- the core requirement for social web = interactivity
- individual interacts with content
- individuals interact with other individuals



Back to preservation tools: PrestoPRIME Technology

- Digital Preservation Demonstration systems
 - Our own, and Ex Libris Rosetta
 - Supporting broadcast files and metadata: MXF
- Lots of work on metadata
 - Collecting, ‘gardening’, mapping
 - Document on audiovisual preservation metadata
 - W3C Media Annotation and Fragments WGs
 - Rights ontology -- for rights automation

- European Networked Centre of Competence
 - Prestocentre.eu
- The plan: membership and other ways to be self-supporting
 - So it doesn't end when the PrestoPRIME project ends



PRESTO
CENTRE

Select Language

Username: *

.....

LOG IN

RSS

BETA VERSION

Home

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Library

Membership

About Us

Keeping audiovisual content alive

LEARN MORE ABOUT US



New Library Additions



Tutorial: Collection Strategy...

RT @NeelieKroesEU: #EU countries need to comply w/ EU rules on #AV #media services. Wrote to 16 MS today to make sure they do. bi ...
20 hours 47 min ago

Follow us on Twitter

News

More news



Screening the Future video registration now online

MARCH 18

On March 14th and 15th, the official launch of PrestoCentre took place at the Screening the Future Conference at the Netherlands Institute for Sound and Vision, in Hilversum, the Netherlands.

Over 200...

Calendar

More calendar

MAR
28

20th International World Wide Web Conference (WWW 2011)

This series aims to provide the world a premier forum for discussion and debate about the evolution of the Web, the...

PrestoCentre Blog

More blog



The challenge of finding video on Google

MARCH 10

Claire Harvey - The past few years have seen the AV archive industry mature and progress at a significant pace. Since the advent of the Presto projects at the beginning of the century, the industry has moved from being manual and analogue...

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Digitisation

File

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Preservation Plans

Research

Standards

Storage

Strategy

Sustainability

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Formats Metadata
Preservation
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And now: one PrestoPRIME tool

- A model for storage systems, to calculate
 - Cost
 - Risk
 - Loss
 - And compare what-if scenarios

Storage Planning Tool – Login - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://prestoprime.it-innovation.soton.ac.uk/planning-tool/accounts/login?next=/plannin

bbc website down

Google Search

Share Bookmarks Check AutoFill

BBC BBC News - Home Storage Planning Tool – Login

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KEEPING AUDIOVISUAL CONTENTS ALIVE

STORAGE PLANNING TOOL

Login

Please enter your username in the box below.

If you do not already have a username then you need to create one so that any model data you create can be saved.

This can be done simply by choosing a name of anything you like that is unique to you, putting it in the box above, then pressing 'Log In'. No password is needed.

Please note that other people will be able to see your saved data if they know or guess your username.

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KEEPING AUDIOVISUAL CONTENTS ALIVE

STORAGE PLANNING TOOL

Storage Systems

Storage Configurations

File Collections

Plans

RichardBBC | [logout](#)

Storage Systems

Found 4 storage systems. [Add...](#)**HDD in servers**

read-only

Migration required every 4 years.

Running Costs

Access: €0.1 per GB

Storage: €1 per GB per year

Corruption Rates

Access: avg. 1 in 500 files

Latent: avg. 1 in 750 files per year

HDD on shelves

read-only

Migration required every 4 years.

Running Costs

Access: €1 per GB

Storage: €0.25 per GB per year

Corruption Rates

Access: avg. 1 in 100 files

Latent: avg. 1 in 500 files per year

Data tapes in a robot

read-only

Migration required every 6 years.

Running Costs

Access: €0.2 per GB

Storage: €0.4 per GB per year

Corruption RatesAccess: avg. 1 in 1×10^4 filesLatent: avg. 1 in 1×10^5 files per year**Data tapes on shelves**

read-only

Migration required every 6 years.

Running Costs

Access: €1 per GB

Storage Systems

HDD in servers

Migration required every 4 years. **Running Costs**

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Latent: avg. 1 in 750 files per year

HDD on shelves

Migration required every 4 years. **Running Costs**

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Access: avg. 1 in 100 files

Latent: avg. 1 in 500 files per year

More Storage Systems

Data tapes in a robot

Migration required every 6 years. **Running Costs**

Access: €0.2 per GB

Storage: €0.4 per GB per year

Corruption Rates

Access: avg. 1 in 1×10^4 files

Latent: avg. 1 in 1×10^5 files per year

Data tapes on shelves

Migration required every 6 years. **Running Costs**

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PRIME

KEEPING AUDIOVISUAL CONTENTS ALIVE

STORAGE PLANNING TOOL

Storage Systems Storage Configurations File Collections Plans

RichardBBC | [logout](#)

Storage Configurations

Found 3 storage configurations. [Add...](#)

Disk with Tape

read-only

System 1: HDD in servers

Files accessed avg of 0.25 times per year, staying constant.

Scrubbing every 1 year(s).

System 2: Data tapes in a robot

Files accessed avg of 0 times per year, staying constant.

Scrubbing every 3 year(s).

Disks on Shelves

read-only

System 1: HDD on shelves

Files accessed avg of 0.25 times per year, staying constant.

Scrubbing every 5 year(s).

System 2: HDD on shelves

Files accessed avg of 0 times per year, staying constant.

Scrubbing every 5 year(s).

tape on shelves

[Edit](#) [Delete](#)

System 1: Data tapes on shelves

Files accessed avg of 2 times per year, staying constant.

Scrubbing every 100 year(s).

System 2: Data tapes on shelves

Files accessed avg of 0.01 times per year, staying constant.

Scrubbing every 100 year(s).

Storage Configuration

Found 3 storage configurations. [Add...](#)

Disk with Tape

System 1: HDD in servers

Files accessed avg of 0.25 times per year, staying constant

Scrubbing every 1 year(s)

System 2: Data tapes in a robot

Files accessed avg of 0 times per year, staying constant

Scrubbing every 3 year(s)



KEEPING AUDIOVISUAL CONTENTS ALIVE

STORAGE PLANNING TOOL

[Storage Systems](#)[Storage Configurations](#)[File Collections](#)[Plans](#)RichardBBC | [logout](#)

File Collections

Found 1 file collection. [Add...](#)**Default File Collection**

read-only

Length of cost/loss projection is 25 year(s).

Files

100 thousand initially, staying constant.

Average File Size

25 GB.

File Collections

- Found 1 file collection. [Add...](#)
- **read-only**
- **Default File Collection**
- Length of cost/loss projection is 25 year(s).
- **Files**
- 100 thousand initially, staying constant.
- **Average File Size**
- 25 GB.

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KEEPING AUDIOVISUAL CONTENTS ALIVE

STORAGE PLANNING TOOL

Storage Systems

Storage Configurations

File Collections

Plans

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Plans

Found 3 plans. [Add...](#)

Default Plan

[Evaluate](#)

File Collection: Default File Collection
25 year lifetime. 100 files, avg. 25 GB in size.

Storage Configuration: Disks on Shelves
Uses HDD on shelves and HDD on shelves systems.

tape on shelves

[Edit](#) [Delete](#) [Evaluate](#)

File Collection: Default File Collection
25 year lifetime. 100 files, avg. 25 GB in size.

Storage Configuration: tape on shelves
Uses Data tapes on shelves and Data tapes on shelves systems.

Disk and Tape

[Edit](#) [Delete](#) [Evaluate](#)

File Collection: Default File Collection
25 year lifetime. 100 files, avg. 25 GB in size.

Storage Configuration: Disk with Tape
Uses HDD in servers and Data tapes in a robot systems.

Plans

Found 3 plans. [Add...](#)

Disk and Tape [edit](#) [Delete](#) [Evaluate](#)

File Collection: Default File Collection

25 year lifetime. 100 files, avg. 25 GB in size.

Storage Configuration: Disk with Tape

Uses HDD in servers and Data tapes in a robot systems.

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KEEPING AUDIOVISUAL CONTENTS ALIVE

STORAGE PLANNING TOOL

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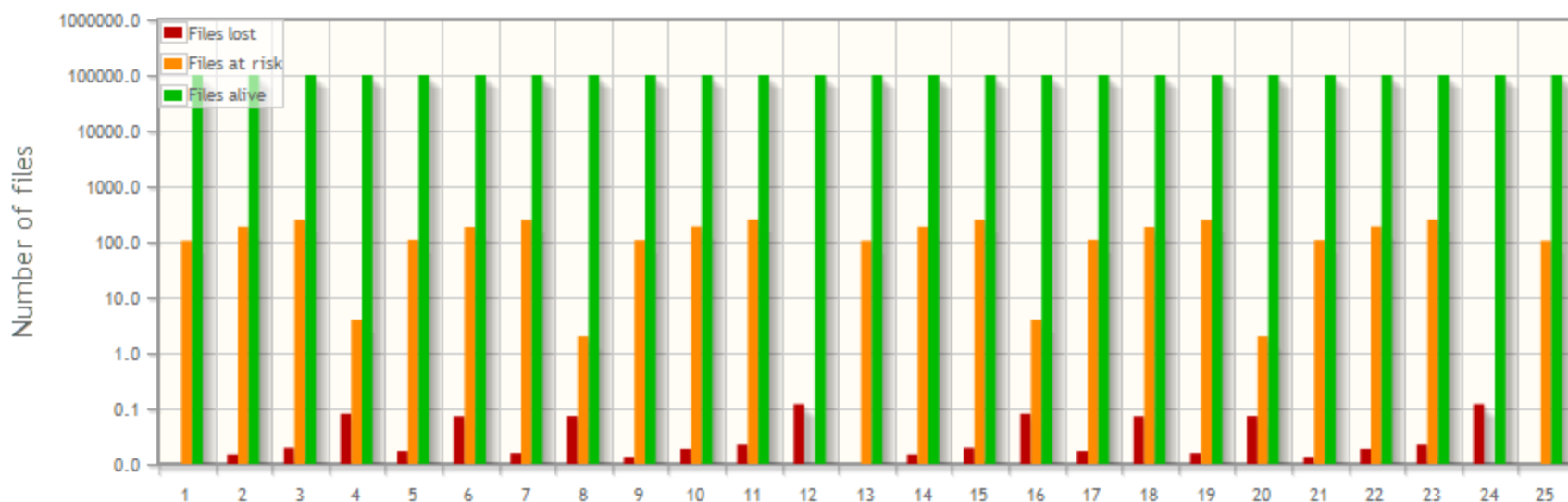
File Collections

Plans

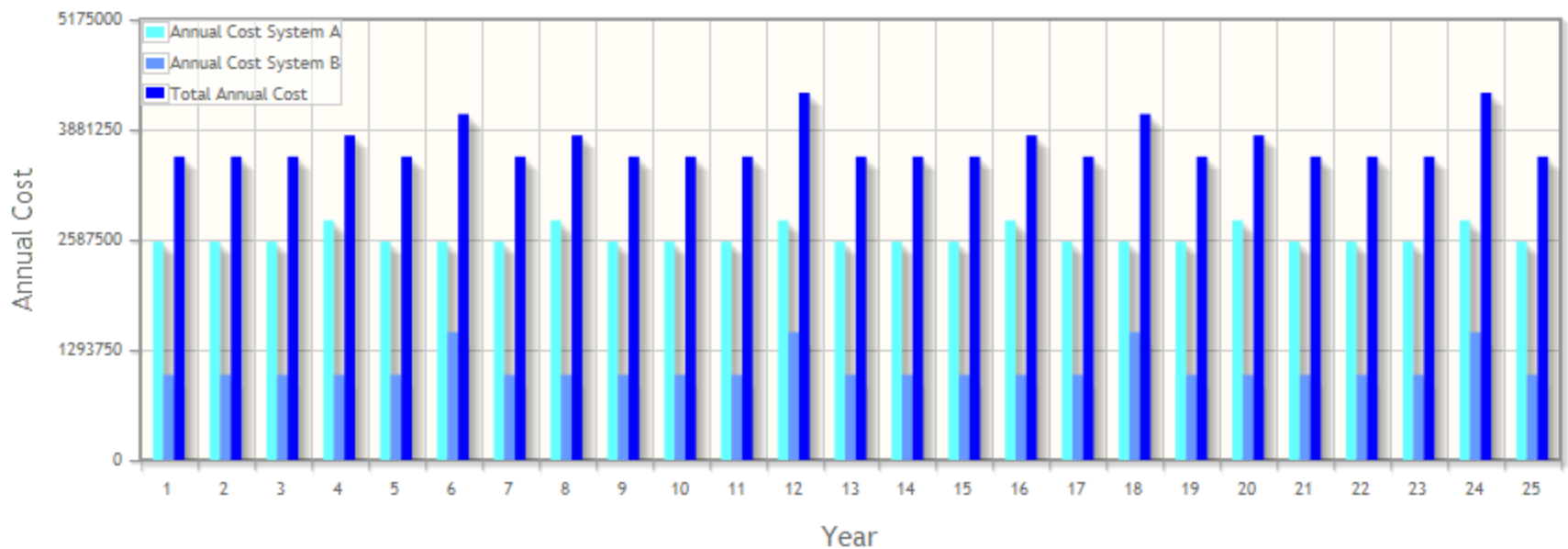
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Evaluation Results

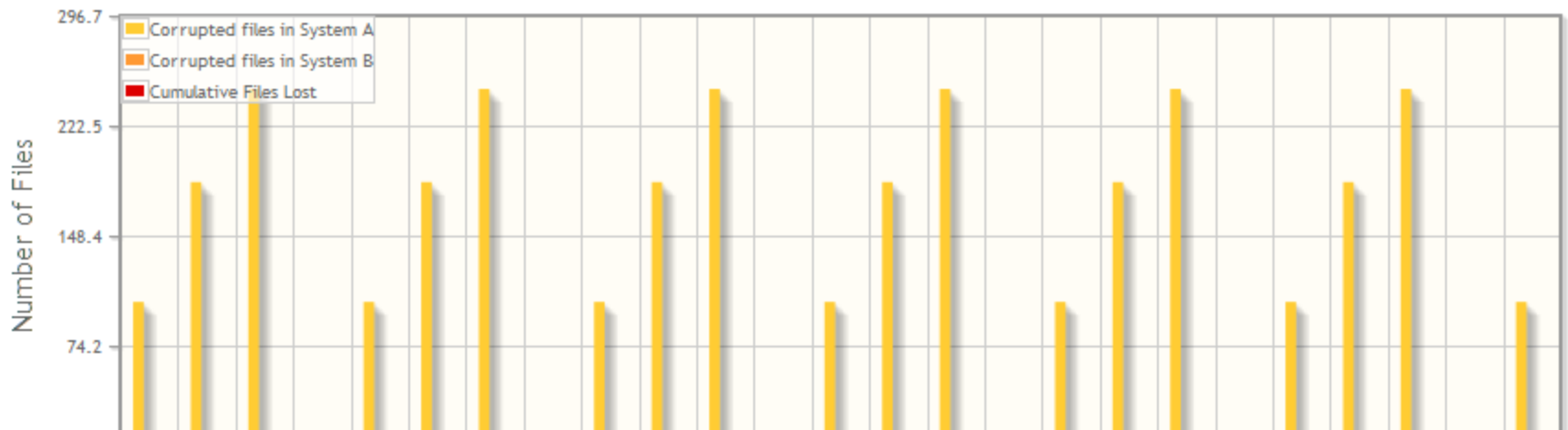
Risk and Loss



Costs



Corruption and Loss



Thank You

- Storage model: <http://prestoprime.it-innovation.soton.ac.uk/planning-tool/>
- PrestoPRIME prestoprime.eu
- PrestoCentre prestocentre.eu
- BBC R&D bbc.co.uk/rd
- Richard Wright richard.wright@bbc.co.uk