ads ARCHAEOLOGY DATA SERVICE

Challenges in Digital Preservation – an ADS perspective

Dr Tim Evans 21-07-2016

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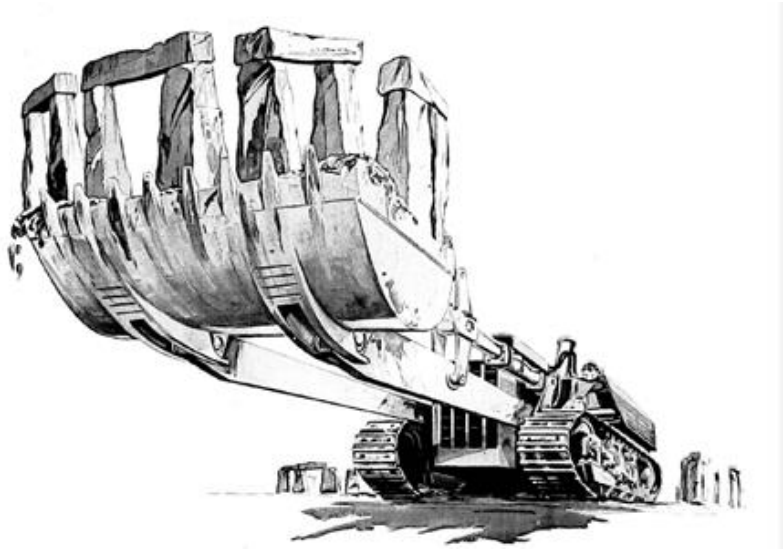
Introduction

The Archaeology Data Service:

- Established in 1996
- Based within the Department of Archaeology, University of York
- Digital archive for UK-based fieldwork and research in archaeology
  - Academic 'research' archives produced by Higher Education
  - The results of development-led fieldwork

What was the impetus in 1996?

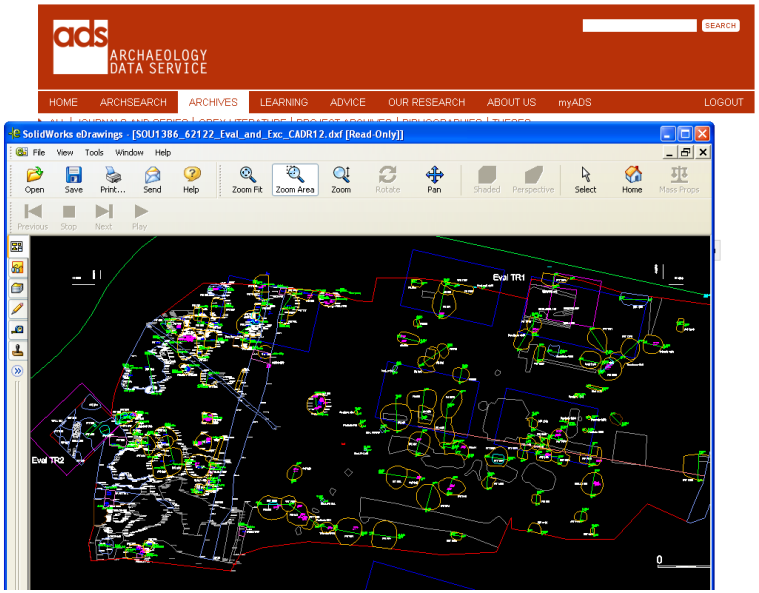
- Is destructive!



- Resources are unique
- The preserved record becomes the main resource for future interpretation

Progress to-date

- Collections
  - 1,100,000 metadata records
  - 700+ rich archives
    - Raster + vector images
    - Databases
    - Geospatial data



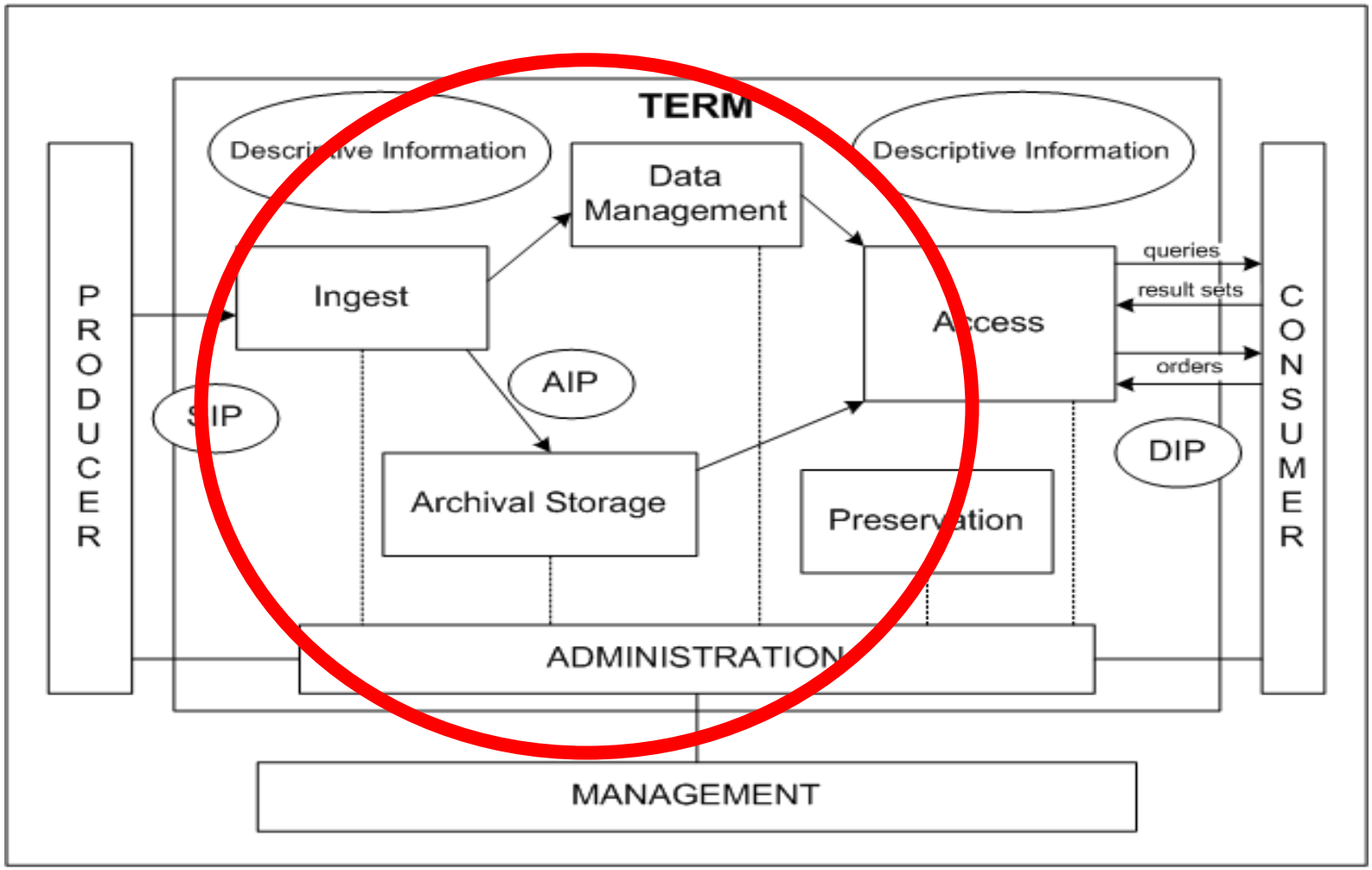


Fig. 1. Major functions of the OAIS Reference Model from Consultative Committee for Space Data Systems (CCSDS), CCSDS 650.0-W-1, Producer-Archive Interface Methodology Abstract Standard. (OAIS). White Book. Issue 1. Draft Recommendation for Space Data System Standards.

http://archaeologydataservice.ac.uk/advice/preservation


DISASTER!

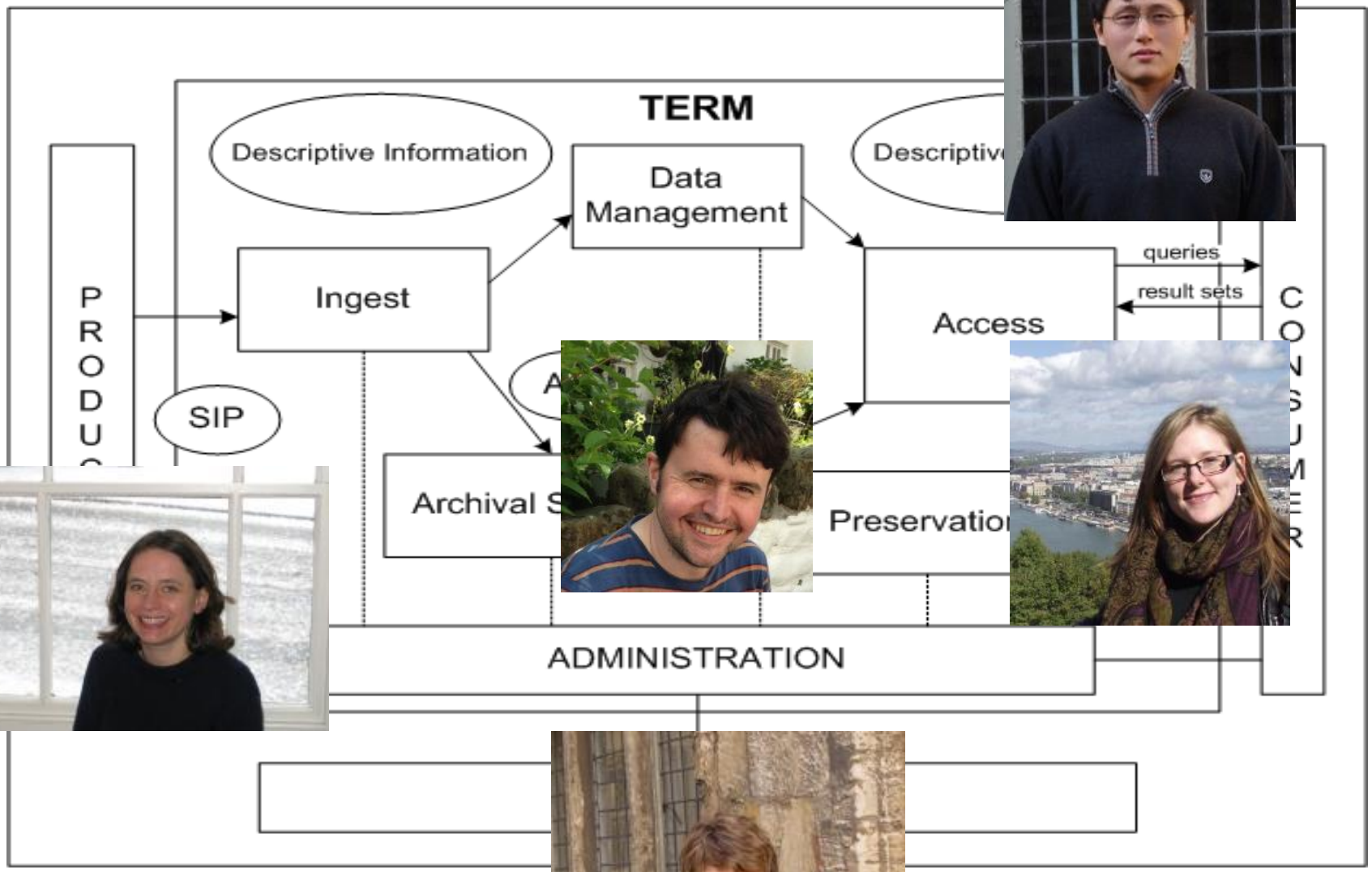


Fig. 1. Major functions of the OAIS Re tative Committee for Space Data Systems (CCSDS), CCSDS 650.0-W- e Methodology Abstract Standard. (OAIS). White Book. Issue 1 r Space Data System Standards.

Funding

Arts & Humanities Research Council

JISC

Historic England

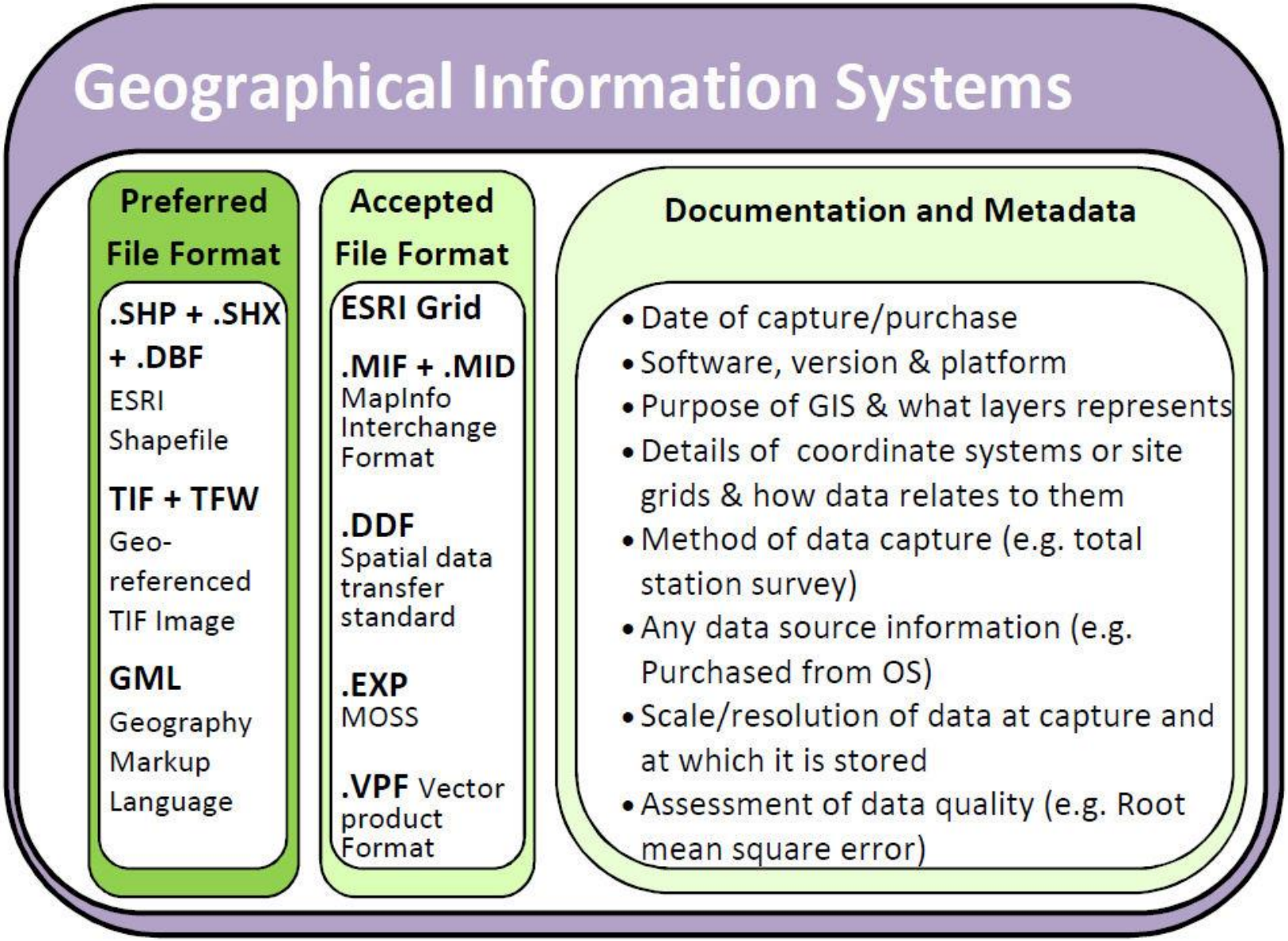
Culture

NATURAL ENVIRONMENT RESEARCH COUNCIL

MEDIN

marine environmental data & information network

Problem 1: People



http://archaeologydataservice.ac.uk/advice

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CompactFlash

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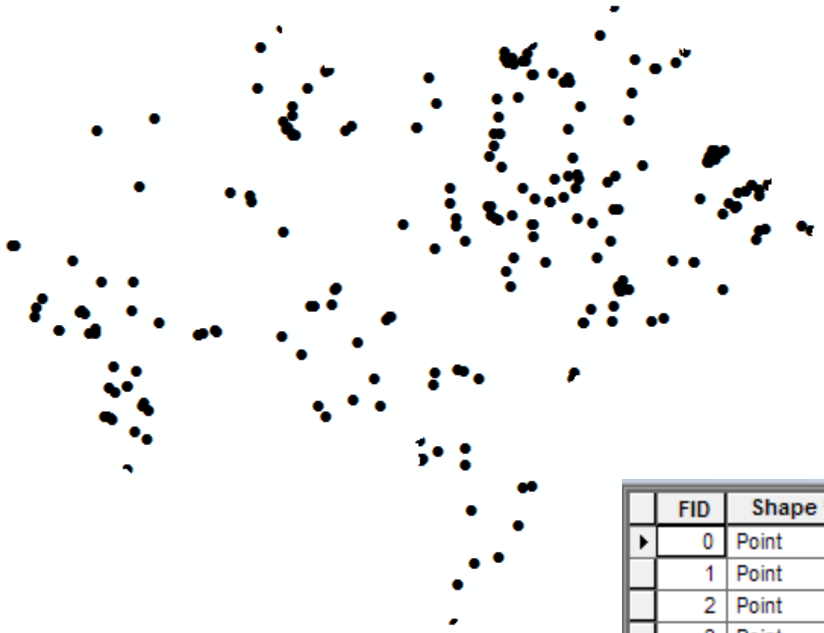
Museum of Archaeological Computing



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	3	Point	ny0049	1028653	EYD6415
	4	Point	ny0051	1030482	
	5	Point	ny0052	1030840	ENY5461
	6	Point	ny0053	1030859	ENY1032
	7	Point	ny0058	1032430	
	8	Point	ny0059	1032435	
	9	Point	ny0060	1032437	
	10	Point	ny0074	1033498	
	11	Point	ny0078	1034566	ENY1793
	12	Point	ny0083	1034965	
	13	Point	ny0085	1034976	
	14	Point	ny0086	1034980	
	15	Point	ny0087	1034981	
	16	Point	ny0089	1035020	
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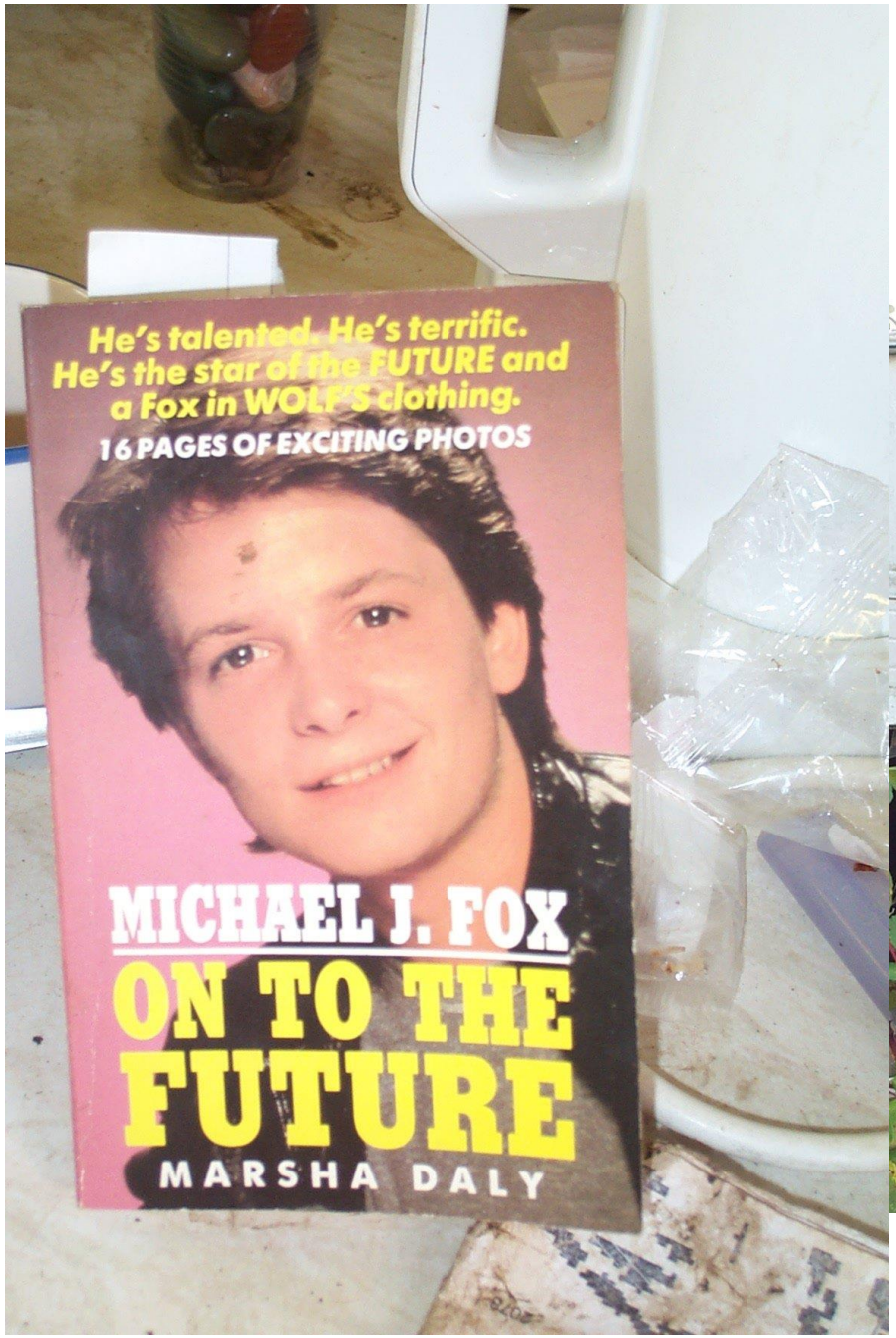

doi:10.5284/1011888

Problem 2:Preservation via migration

- Every file accessioned preserved as a standardised format e.g. all raster images as uncompressed TIFF, databases as delimited text…
- Formats used based on a mixture of technical consideration (e.g. compression = data loss), but also judgements on longevity of format and ease of establishing future migrations.

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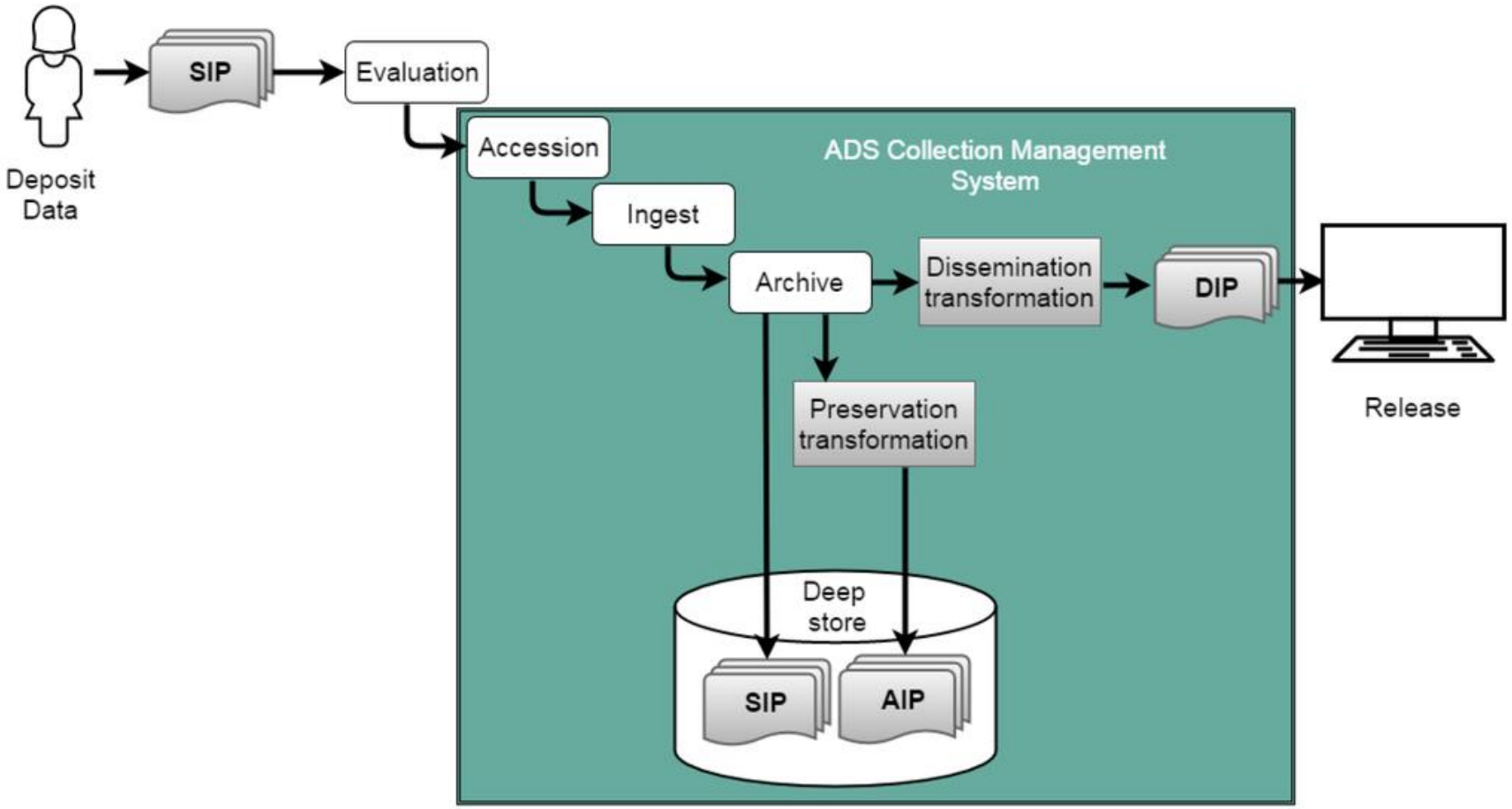
Operational workflow



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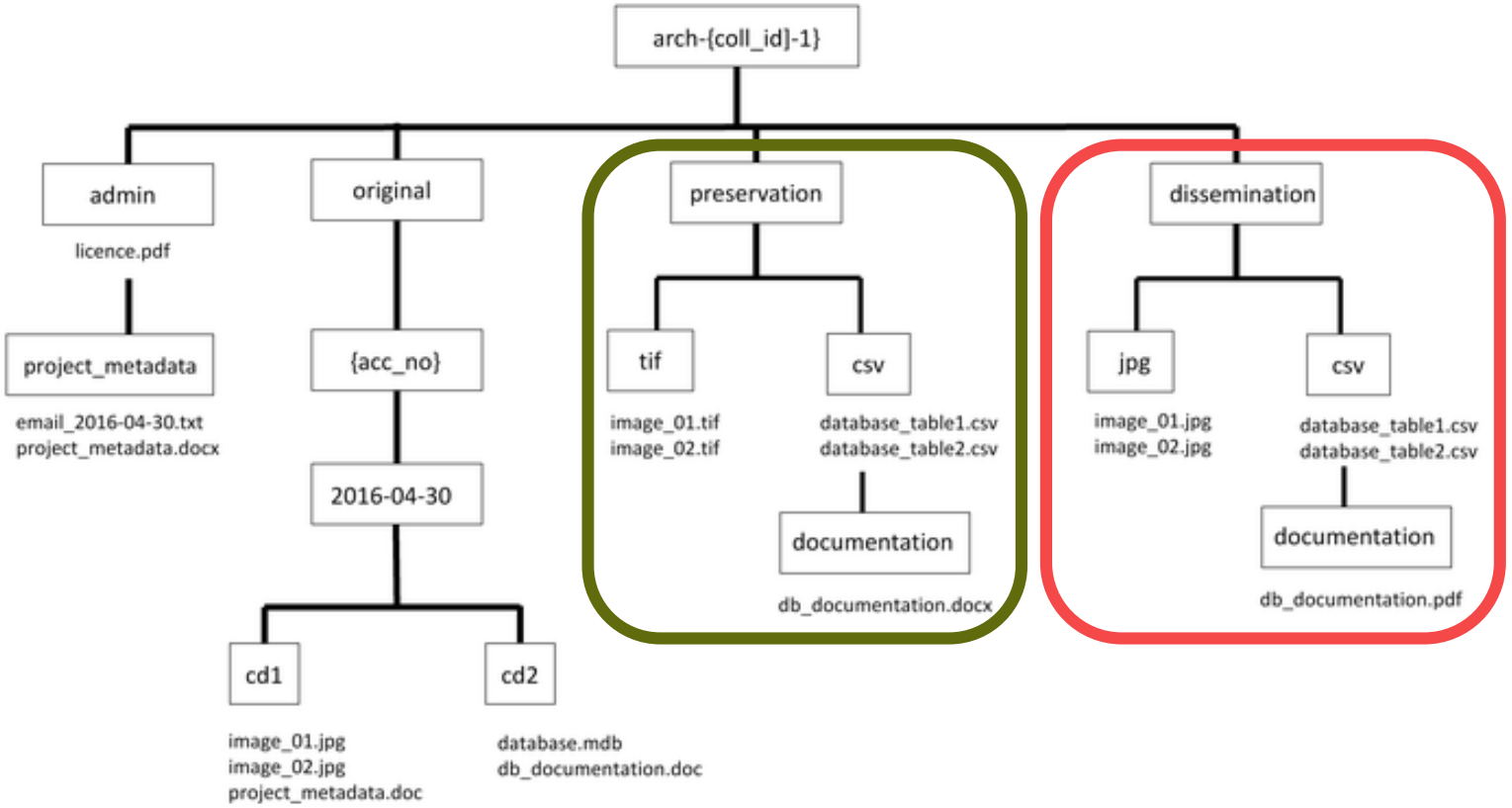
Example structure



In more detail…

- Query of the ADS Object Management System returned:
  - 2,118,052 files
  - 860,190 of which are in SIP
    - 253 unique formats
  - By contrast only 28 unique formats used in the AIP

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Most popular?

- 320,000+ .tif
- 180,000+ .jpg (1.01)
- 105,000+ .jpg (1.02)
- 20,000+ .jpg (raw)
- 17,000+ .pdf (1.4)
- 16,000+ .pdf (1.6)
- 13,000+ .doc (97-2003)

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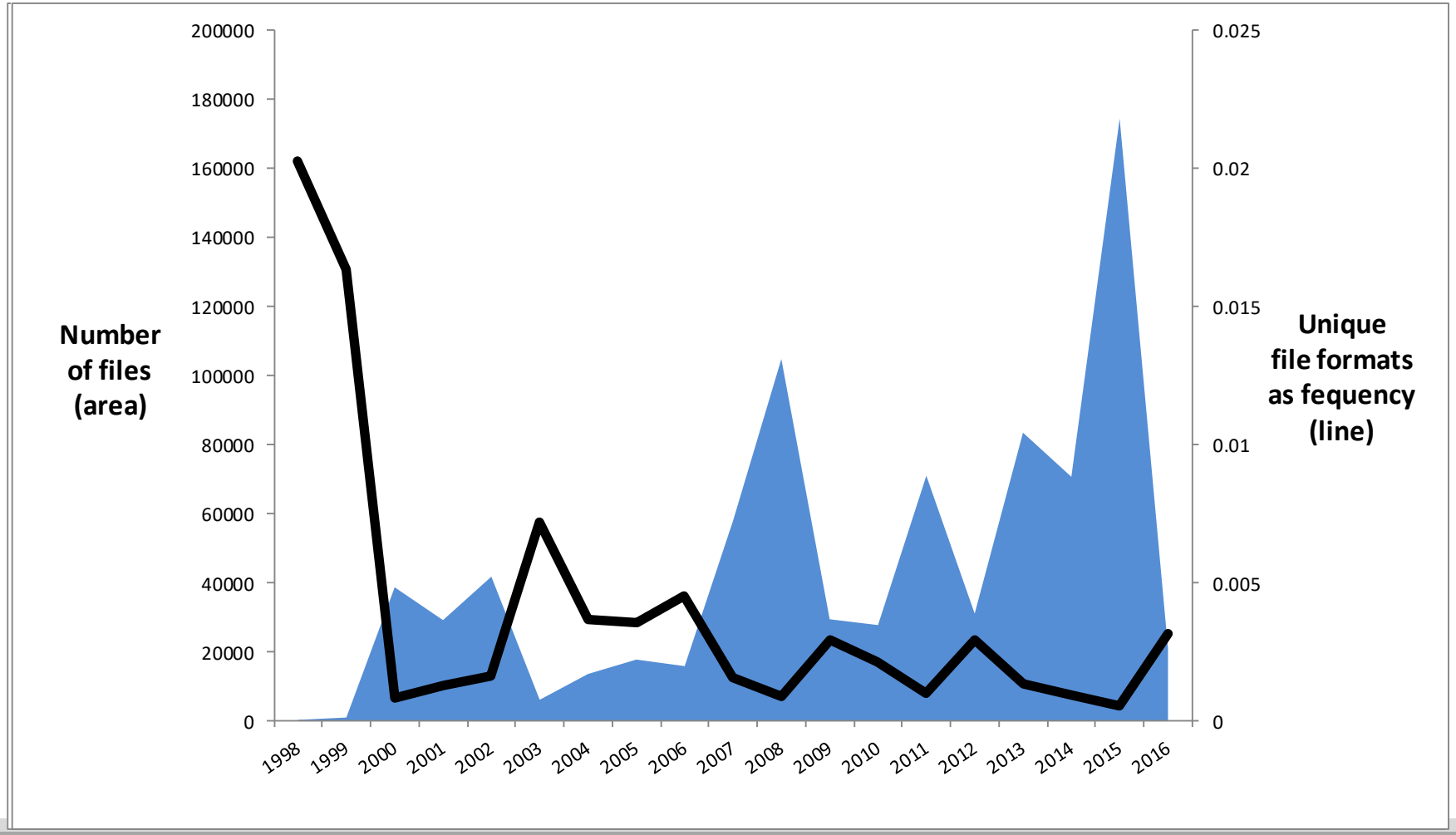
More data – less variation



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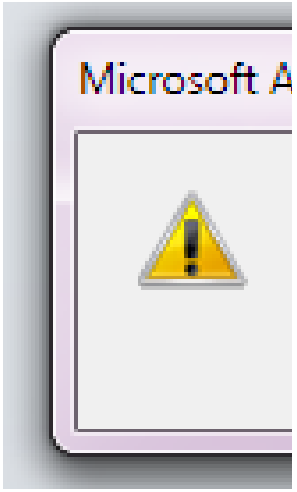
"Cannot Open a database created with a previous version of your application" error in Access 2013 and Access 2016

Email
Print



This issue occurs when you try to use Access 2013 or later version of Microsoft Access to open an Access 97 database. To work around this issue, use a pre-Access 2013 version of Access to save the Access 97 database as an .accdb file:

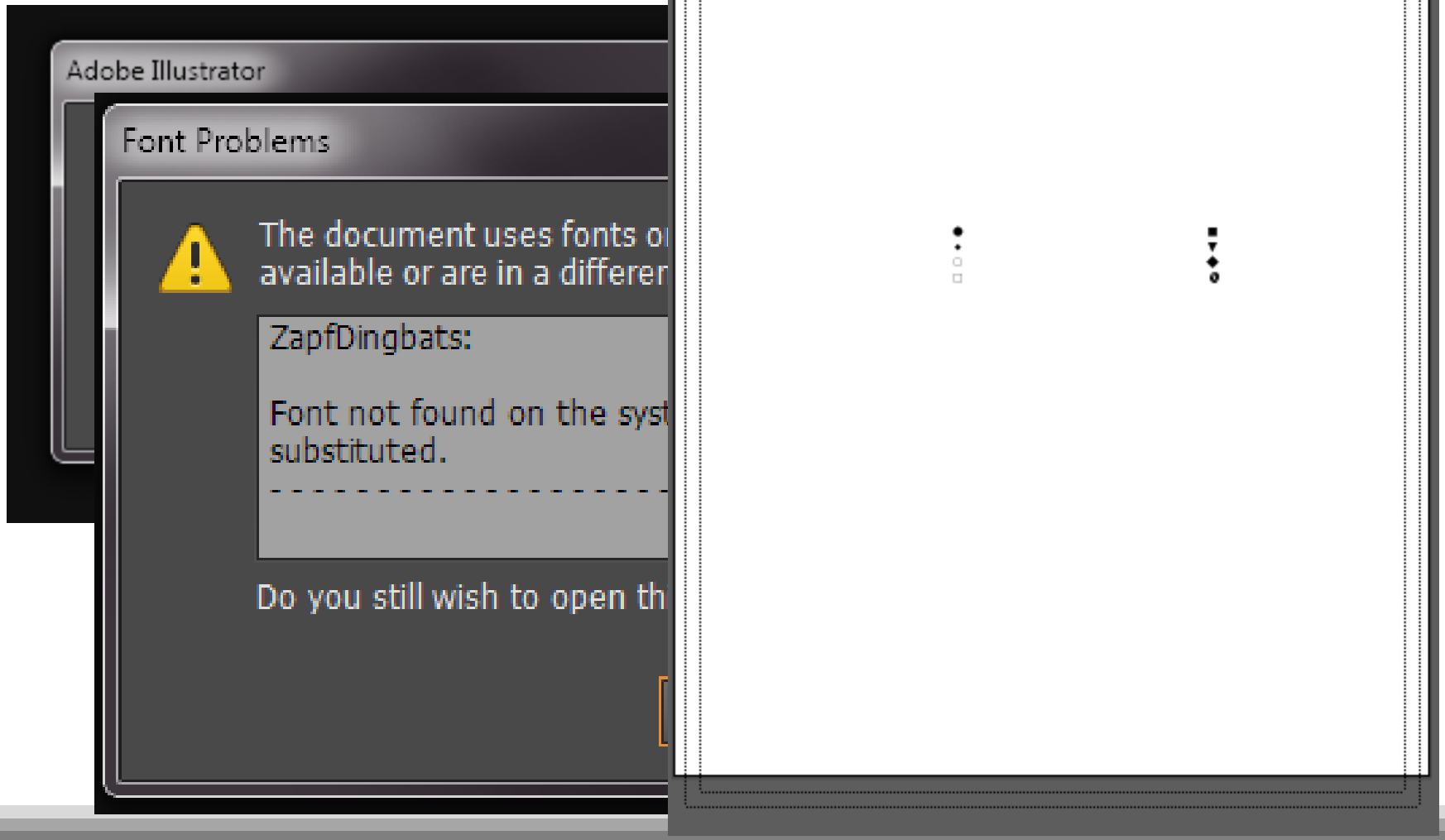
1. Open the Access 97 database in Access 2003.
2. On the **Tools** menu, click **Database Utilities**, click **Convert Database**, and then click **to Access 2002-2003 file format**.
3. Enter a name for the database, and then click **Save**.
4. Exit Access 2003.
5. Open the database in Access 2013 or later version of Access.
6. On the **File** tab, click **Save As**, select **Access Database (*.accdb)**, and then click **Save As**.
7. In the **Save As** dialog box, click **Save**.

Cause

This issue occurs because recent versions of Access cannot convert Access 97 files.

Unusual formats

- 594 GSSI RADAN data file .dzt
  - A proprietary format created by a US-based geophysical company
  - At the moment *can only* be exported using RADAN software
- 21 Harris Matrix .hm
  - A stand-alone product created by a (now ended) research project


Adobe Illustrator
Font Problems
The document uses fonts o
available or are in a differer
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substituted.
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User Reviews

Current Version		All Versions	
out of 14 votes		out of 14 votes	
5 star	4	5 star	
4 star	0	4 star	
3 star	0	3 star	
2 star	0	2 star	
1 star	10	1 star	

Sort: Date

★★★★★ "If you want to waste 10

June 12, 2013 | By uk-guy567 | Version: Ai Viewer 3.2

Pros

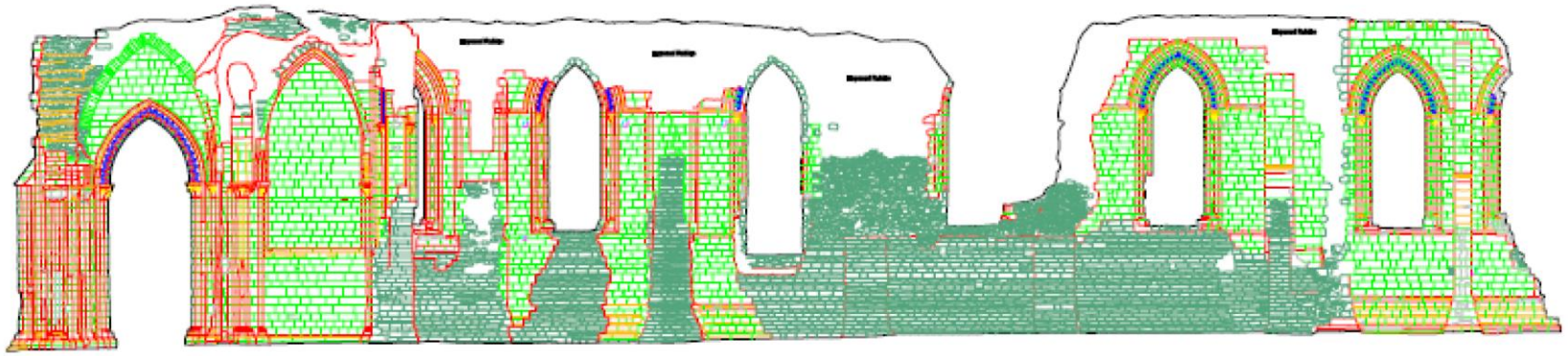
None found

Cons

Crashes on opening under Win7

CAD migration

- CAD – defacto Autodesk's AutoCAD software
- ADS had traditionally used DXF (R14) in AIP and DIP support for textual encoding (ASCII) and its primary purpose as an exchange format which could be used beyond Autodesk software



CAD migration

- Due to the fast development of the AutoCAD software, the DXF format has seen almost as many version updates as the proprietary DWG format (which has seen eighteen new versions since 1982)
- Effectively using an old format for new content – at risk of losing data!
- As a result, the decision was made in early 2014 to change the ADS archiving policy and adopt DWG version 2010 (AC1024)

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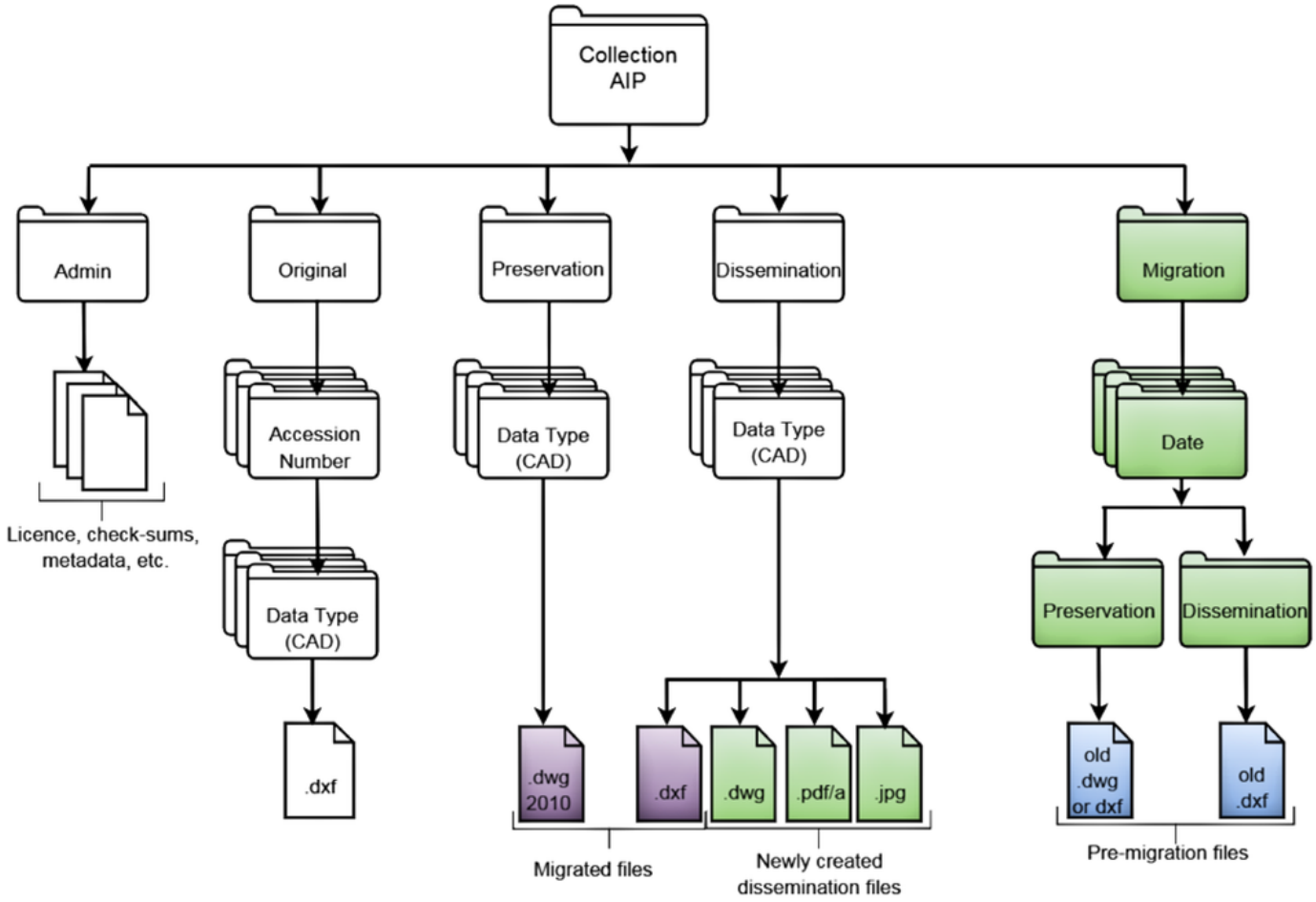
CAD migration



Lessons

- Did have a cost impact
- Mitigated by file management
- Perhaps most importantly: file format not as important as knowing what it was we were actually meant to be preserving = importance of metadata

Migrating 2 and 3D Datasets: Preserving AutoCAD at the Archaeology Data Service
ISPRS Int. J. Geo-Inf. **2016**, *5*(4), 44; doi:10.3390/ijgi5040044

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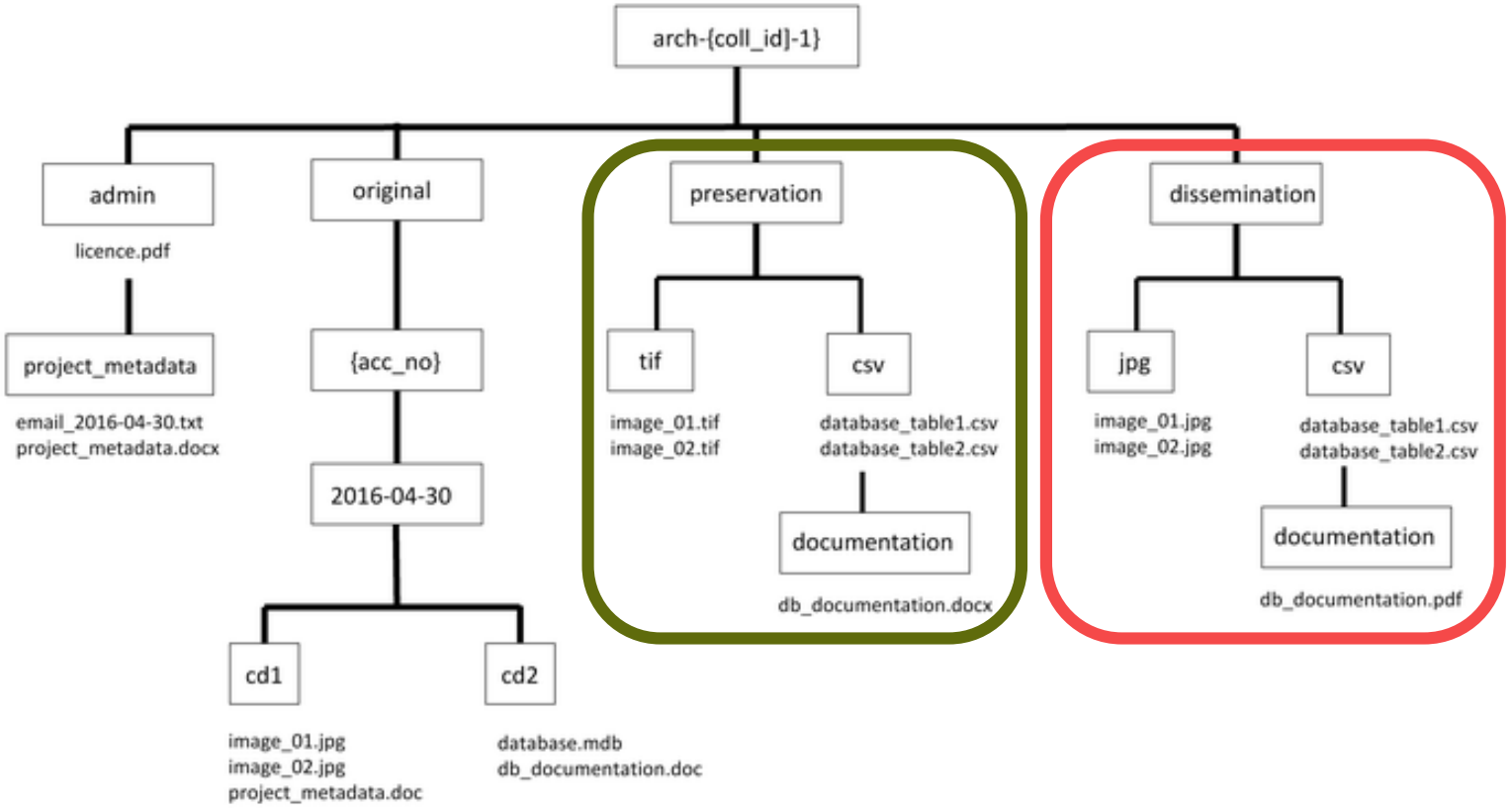
Will this ever change?

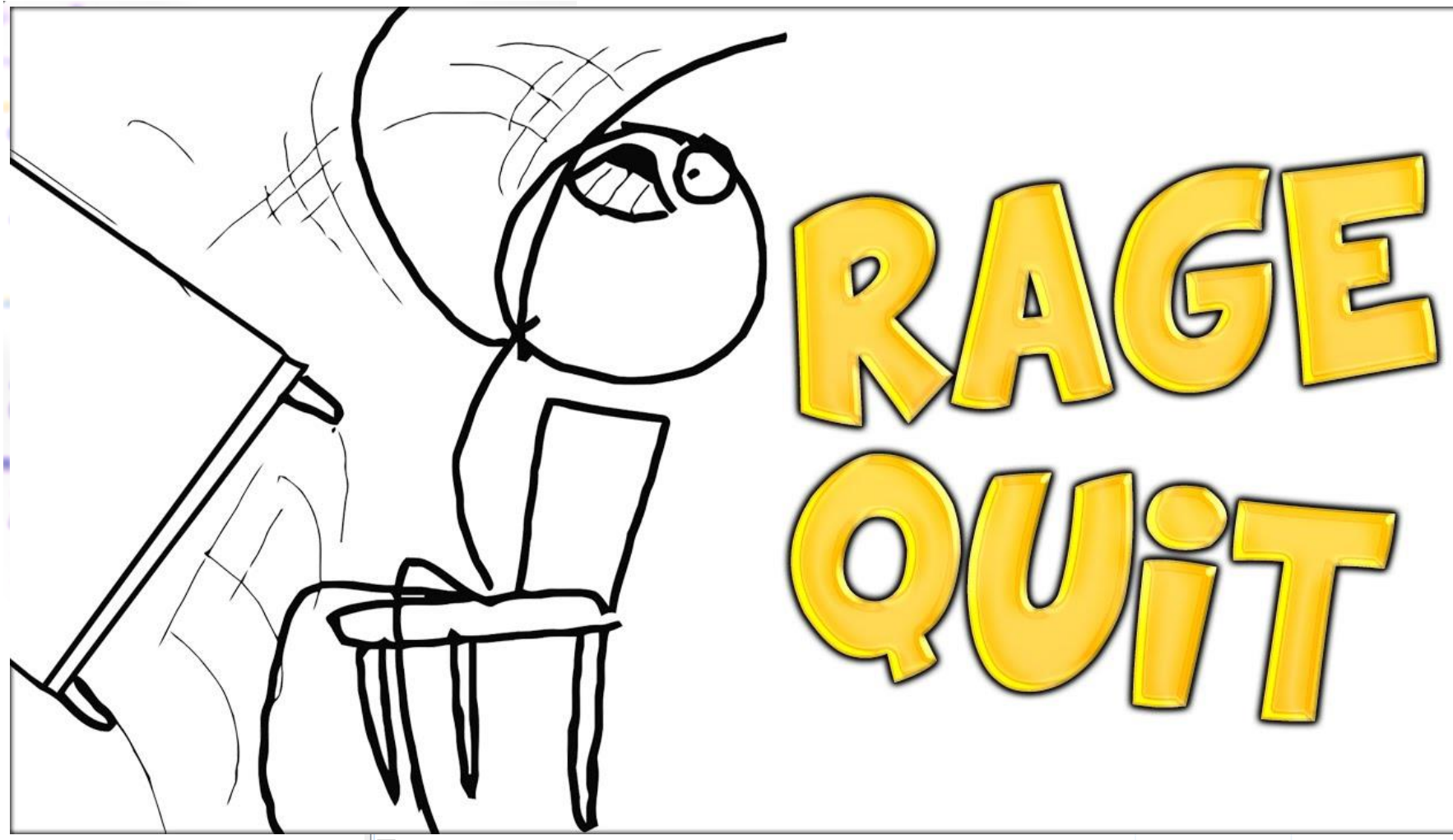


Future migrations

- DOCX
  - When ADS started using OOXML formats were using Office 2010, which only supported the ISO 29500 Transitional standard
  - Although it is anticipated that the transitional format will continue to be supported (including OpenOffice), is it better to move away now?

Problem 3: File management

- Query of the ADS Object Management System returned:
  - 2,118,052 files
  - 20+ Tb
- How do we know what we have?
- How do we manage 'objects' comprising different files/data streams?



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General_Shot_of_Trench_13.tif	59,084 KiB	14/06/2016 16:10:38
General_Shot_of_Trench-16.tif	59,084 KiB	14/06/2016 16:10:49
IMG_0024.tif	59,084 KiB	14/06/2016 16:10:39
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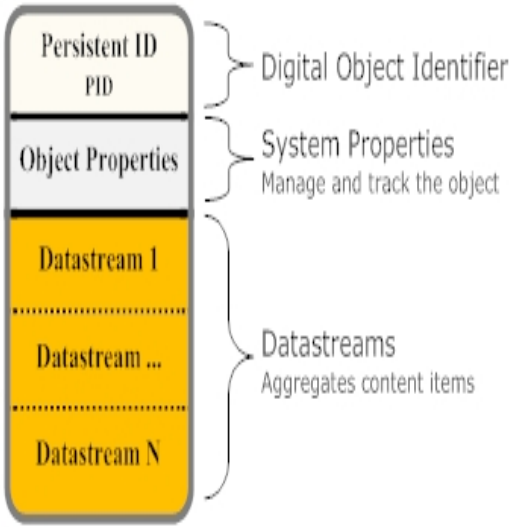
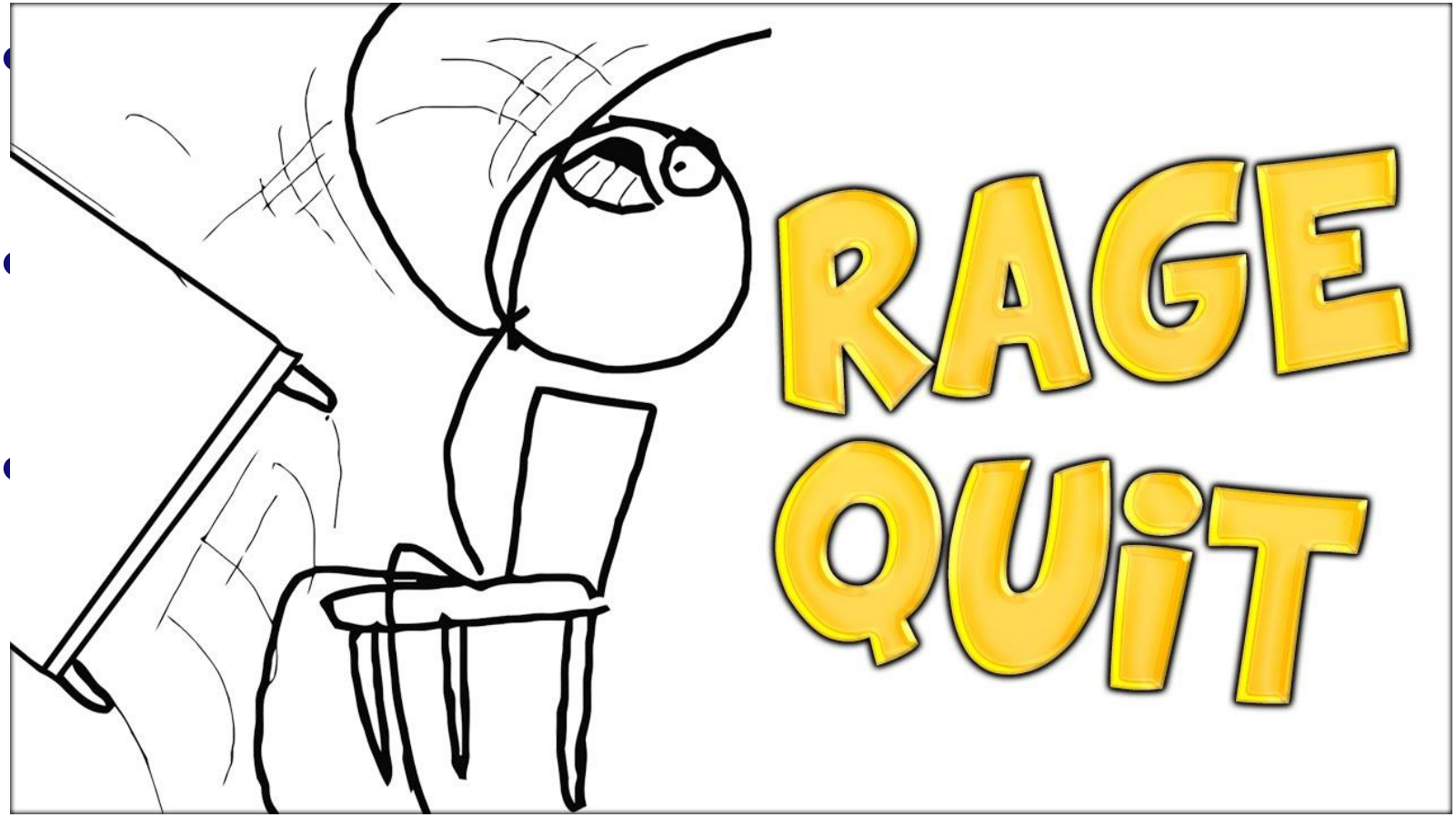
IMG_0041.tif	59,084 KiB	14/06/2016 16:10:42
IMG_0044.tif	59,084 KiB	14/06/2016 16:10:43
IMG_0048.tif	59,084 KiB	14/06/2016 16:10:45

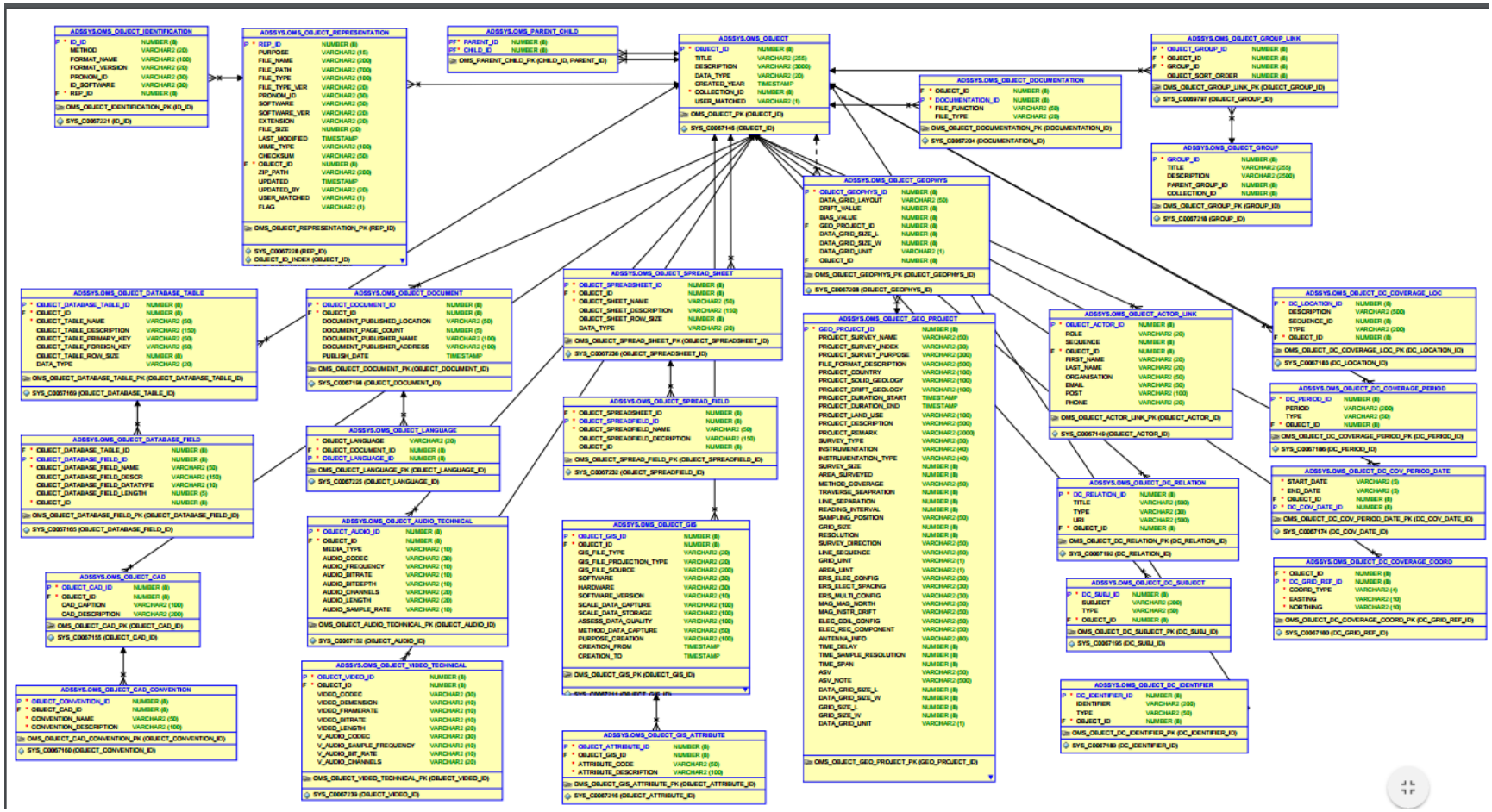
Fedora

- Implementing Fedora (Flexible Extensible Digital Object Repository Architecture).



Fedora




ADSSYS.OMS_OBJECT_IDENTIFICATION
ADSSYS.OMS_OBJECT_REPRESENTATION
ADSSYS.OMS_PARENT_CHILD
ADSSYS.OMS_OBJECT
ADSSYS.OMS_OBJECT_DOCUMENTATION
ADSSYS.OMS_OBJECT_GROUP_LINK
ADSSYS.OMS_OBJECT_GROUP
ADSSYS.OMS_OBJECT_GEOPHYS
ADSSYS.OMS_OBJECT_GEO_PROJECT
ADSSYS.OMS_OBJECT_ACTOR_LINK
ADSSYS.OMS_OBJECT_DC_COVERAGE_LOC
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332,348	2009-09-10 2...	image/jpeg	cb1c33f2b613fad68c8f743a6e00003c	1,000,914
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14,761,790	2009-11-21 0...	image/tiff	1c14156f502dec925b3b84e8b96f0448	1,001,418
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1328033	Map of traditonal farmsteads in Greater Lincolnshire with detached farm houses	GIS	12-Sep-2015	detached_point.dbf detached_point.prj detached_point.shp detached_point.shx detached_point.gml detached_point.prj detached_point.xsd detached_point.zip
1328032	Map of traditonal farmsteads in Greater Lincolnshire with zadditonal deatched elements to main plan	GIS	12-Sep-2015	d_point.dbf d_point.prj d_point.shp d_point.shx d_point.gml d_point.prj d_point.xsd d_point.zip

JonathanParkhouse_Warwickshire.pdf
LizPearson_Environmental.pdf
MalcolmAtkin_Worcestershire.pdf
MarkBowden_Earthworks.pdf
MikeHodder_Birmingham.pdf
PaulStamper_Countryside.pdf
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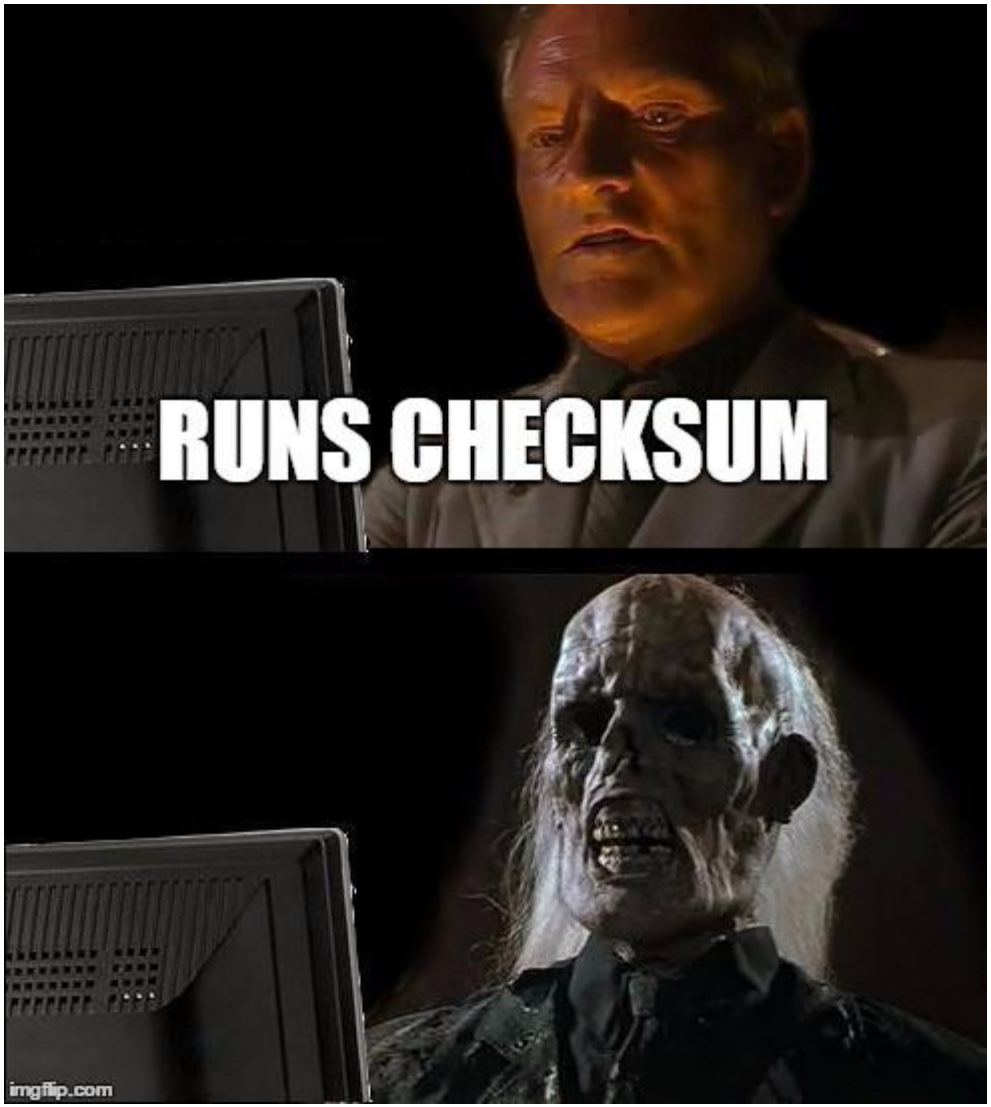
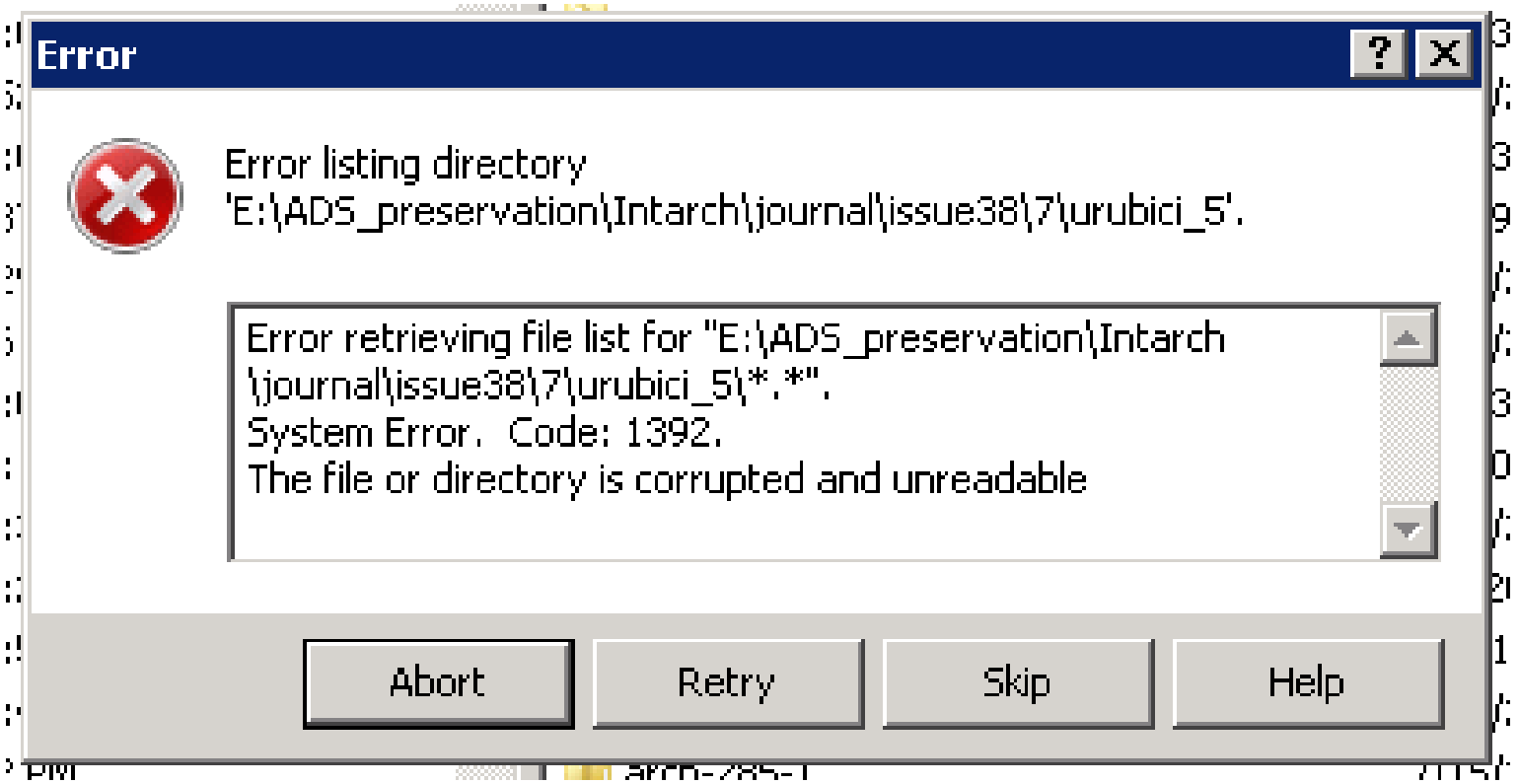
JamesGreig_Environmental.pdf
JohnHalsted_BronzeAgeShropshire.pdf


RUNS CHECKSUM
imgflip.com


Error
Error listing directory
'E:\ADS_preservation\Intarch\journal\issue38\7\urubici_5'.
Error retrieving file list for "E:\ADS_preservation\Intarch
\journal\issue38\7\urubici_5*.*".
System Error. Code: 1392.
The file or directory is corrupted and unreadable
Abort
Retry
Skip
Help

What's an object?

1373975	EAA_REPORT_9_VOL_2	Text	09-Nov-2015	EAA_REPORT_9_VOL_2.pdf EAA_REPORT_9_VOL_2.pdf EAA_REPORT_9_VOL_2.pdf EAA_REPORT_9_VOL_2.zip.001 EAA_REPORT_9_VOL_2.zip.002
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Mis-identification

File Name	**MapInfo-GIS-files-for-the-Historic-Landscape-Character-Areas-and-Zones.TAB**
Rep Id	3356836
Purpose	Original
File Path	/ADS_preservation/arch-2248-1/original/5444/2016-02-04/MapInfo-GIS-files-for-the-Historic-Landscape-Character-Areas-and-Zones.TAB
File Type	
File Type Ver	
Pronom Id	
Extension	tab
File Size	208
Last Modified Date	04-Feb-2016
Mime Type	
Checksum	143d4b27e18936a0a93cdd348bb4ec61
Updated	04-Feb-2016
Updated By	kjn103

File Name	**detached_point.gml**
Rep Id	3324042
Purpose	Preservation
File Path	/ADS_preservation/arch-2128-1/preservation/gml/GIS_Layers_and_Data/Farmstead_data_extractions/House_Position/detached_point.gml
File Type	Extensible Markup Language
File Type Ver	1.0
Pronom Id	fmt/101
Extension	gml
File Size	11672363
Last Modified Date	17-Nov-2015
Mime Type	application/xml, text/xml
Checksum	3ae4[illegible]b75b99b880ae29d
Updated	04-Dec-2015
Updated By	te1

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Thanks!

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