

# Development of a Pilot Data Management Infrastructure for Biomedical Researchers at University of Manchester – Approach, Findings, Challenges and Outlook of the MaDAM Project

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JISC

+ University of Manchester  
Contribution

# MaDAM Project Overview

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**Aim:** To produce a technical & governance solution based on researchers' requirements with flexibility to meet needs across multiple research groups / disciplines and taking into account the institutional landscape and its policies (October 2009 – June 2011).

**Rationale:**

- Researchers need to be supported to manage their data well (day-to-day) and comply with legal and funder policies.
- Funders want to ensure public money spent on research is maximised → this means ensuring research data is preserved for reuse.
- Potential future value in data assets needs to be preserved.

**Background:** No existing institutional repository or strategy for management of research data – BUT the MaDAM Pilot became part of a wider endeavour at University of Manchester to develop such.

# The MaDAM Solution will..

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- Provide trusted secure storage to reduce risks of data loss and to adhere to funders' (new) retention policies
- Make metadata visible and searchable - enable annotation of data including ad hoc context and 'notes to self'
- Facilitate easier, more secure owner-controlled data sharing
- Reduce redundancy: structured space, enable linking
- Maintain media and format accessibility for long term reuse
- Ensure that technical and non-technical solutions for managing and sharing data will fit in with the research& data lifecycle, diverse working practices, cultures and disciplines

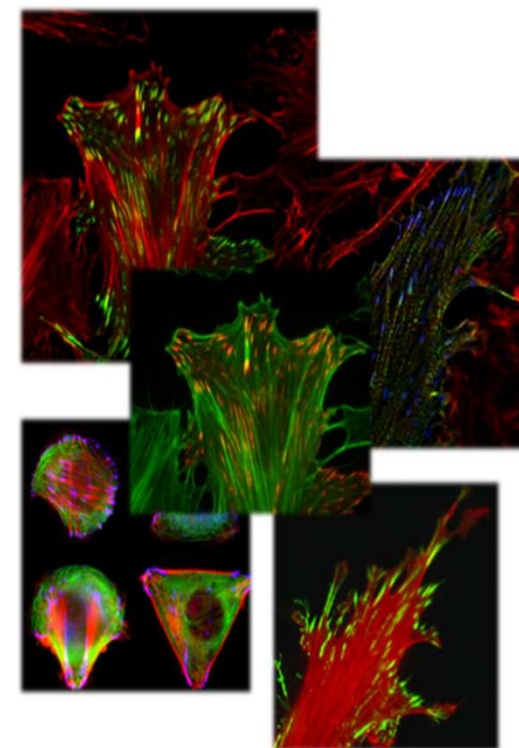
# MaDAM Domains & Pilot User Groups

## Biomedical Domain at University of Manchester

1. Life Sciences Electron and Standard Microscopy: 4 groups with 8 active core users plus occasional users
2. Medical Science MRI Neuropsychiatry Unit: 1 group/5 users

Images as main Research Objects, but also other data types (text docs, metadata, statistical and output data)

The work with the pilot user groups was further complemented by information/requirements gathered from additional researchers and PIs within the domain, IT and experimental officers as well as research and data policy managers.

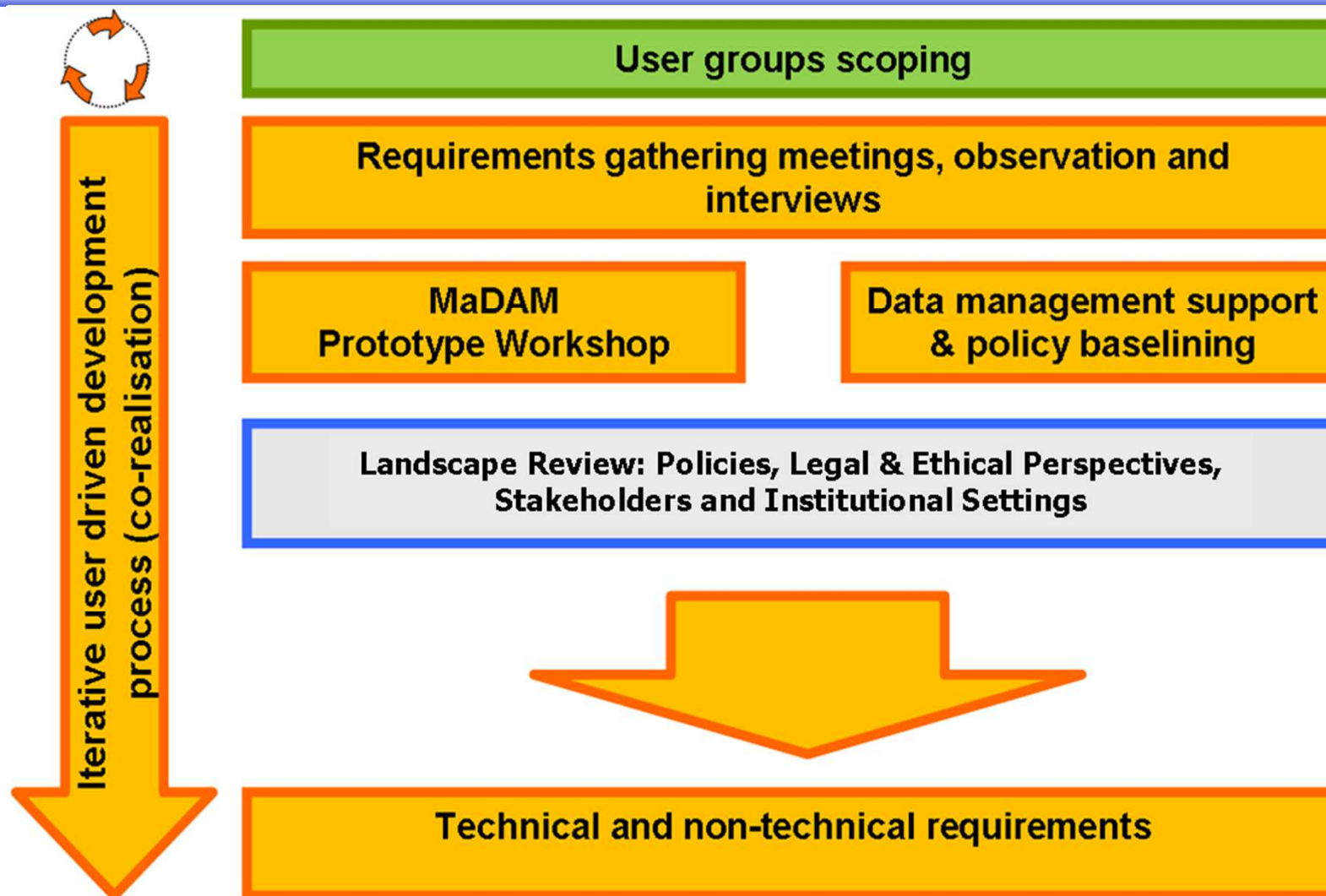


Up to 12 different file types  
From 0.5MB to 17GB/file

### **'Raw data'**

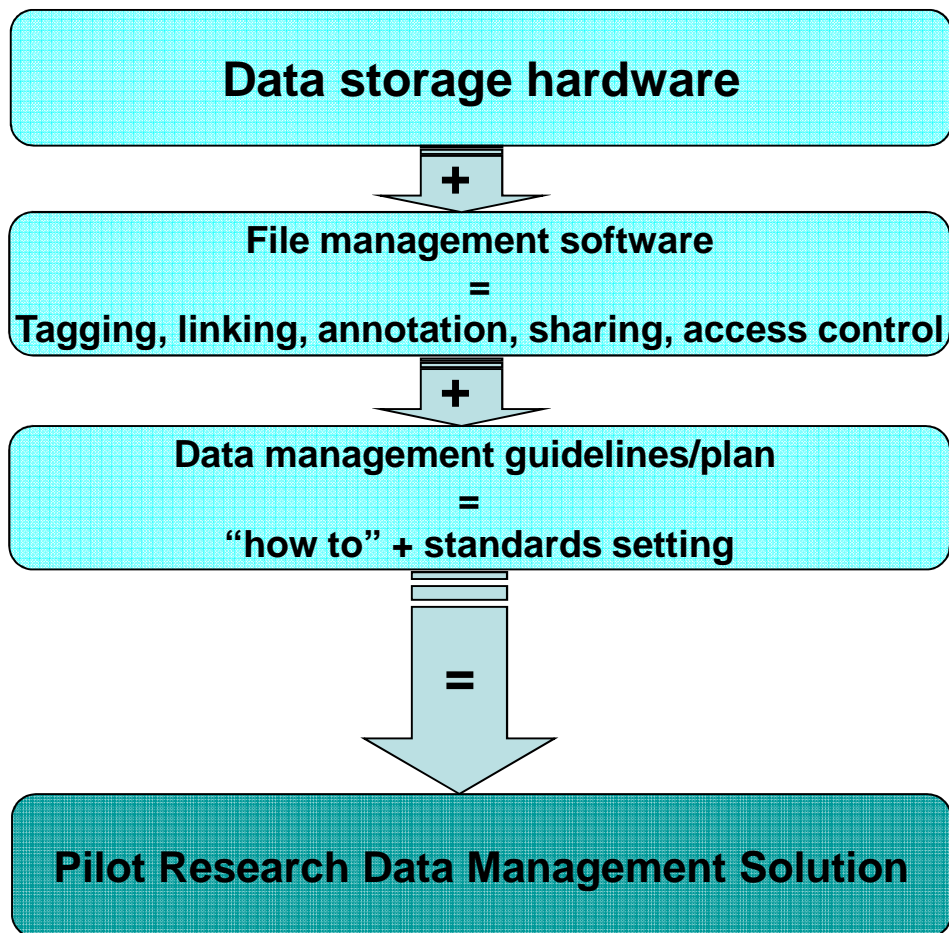
- > Microscope samples: single run creates any image set from 1-200 GB
- > MRI brain scans: usually one study consists of 20-40 GB

# MaDAM 'Method-flow'



# MaDAM Pilot Overview

## Aim: Pilot Research Data Management Solution



## Many angles to cover:

- Research Practice
- Discipline/Domain
- Technical Solution
- Policies/Procedures
- Institutional Settings  
(Stakeholders & Infrastructure)
- Funding Landscape
- Cost-Benefit Analysis



# Pilot Users: Findings

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- No official backup policies to protect against loss of data
  - Decentralized & fragmented storage (USB sticks, optical disks)
  - Limited ability to share data internally or externally
  - High levels of redundant data (duplicate copies)
  - No structured annotation of data
  - Limited search capabilities
  - Limited means to disseminate data
  - No archiving policies to guarantee long term curation
- waste of time – risk of data loss – finding, reuse & sharing difficult – clogging of valuable storage space**

# Main Requirements

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- Generic need for trusted, structured central storage with auto-back up and improved capabilities for reuse, sharing, searching and overall management of data files.
- The prototype provides a navigation structure based on researchers' projects and experiments, centralized and backed up data storage, access rights, linkage and annotation of research data and a search function.
- Need for good practices in data management and digital curation policies to tie in with researchers' actual research practice, institutional settings and cultures.



# Final Web-based MaDAM Pilot System

MANCHESTER 1824

Search Welcome: Meik Poschen Madam Group Logout

Data | Setup | Help

Home Page Search Calendar Bookmarks Latest Data Recycle Bin Feedback

Checkout > PubsA

Explorer

- Checkitout (W)
- BenefitsCaseStudy
- BusinessCase
- ProjectReports
- PubsA
  - draft = 0
  - internal doc = 1
  - published = final
- MaDAM-BusinessCaseFull-draft...
- PubsConf
- Madam Project (W)
- V4 Testing (W)

Upcoming reminders (next 2 weeks)

No review dates upcoming

PubsA

[Update](#) [Delete](#)

**Name** PubsA

**Comments** project docs

**Creator** Meik Poschen **Owner** Meik Poschen

**Create Date** 17-MAY-2011 11:07 **Review Date**

**Status** Available **Folder Type** Publication

**Folder Size** .09M **File Count** 1 (0)

**Folder Details**

Files

Name	Created On	Mime Type	Size / MB	Created By
MaDAM-BusinessCaseFull-draf...	17-MAY-2011 11:32	application/msword	0.09	Meik Poschen

1 - 1

Sub Folders

Attributes

Keywords

Notes

Help

Page Help

Create

Create "Folder"

Folder Actions

- Upload Files
- Download Folder
- Create Note
- Email Folder Link
- Bookmark Folder
- Create Shortcut
- Move Folder
- File View

Attributes

- Add Template
- Add Adhoc

# MaDAM Pilot: Thumbnails

[Home Page](#) | [Search](#) | [Calendar](#) | [Bookmarks](#) | [Feedback](#)

**File List**

- ☐ FRAPb1Series40\_t07\_ch00.tif
- ☐ FRAPb1Series40\_t01\_ch01.tif
- ☐ FRAPBleachSeries38.xml
- ☐ FRAPBleachSeries38\_t1\_ch01.tif
- ☐ FRAPb1Series40\_t19\_ch00.tif
- ☐ FRAPBleachSeries38\_t2\_ch01.tif
- ☐ FRAPb1Series40\_t06\_ch01.tif
- ☐ FRAPb1Series40\_t15\_ch01.tif
- ☐ FRAPb1Series40\_t19\_ch01.tif
- ☐ FRAPPreSeries39\_t1\_ch00.tif
- ☐ FRAPb1Series40\_t14\_ch00.tif
- ☐ FRAPb1Series40\_t06\_ch00.tif
- ☐ FRAPPreSeries39\_t3\_ch00.tif
- ☐ FRAPb1Series40\_t11\_ch01.tif
- ☐ FRAPb1Series40\_t00\_ch00.tif
- ☐ FRAPb1Series40\_t20\_ch00.tif
- ☐ FRAPb1Series40.xml
- ☐ FRAPb1Series40\_t16\_ch00.tif
- ☐ FRAPb1Series40\_t10\_ch01.tif
- ☐ FRAPb1Series40\_t17\_ch00.tif
- ☐ FRAPPreSeries39.xml

**Thumbnails - Number of Columns**

Thumbnail grid showing 15 images in a 3x5 layout. The images are fluorescence microscopy images of cells, showing various patterns of red and green fluorescence. Each thumbnail has a timestamp in the bottom right corner.

## MaDAM Pilot: Metadata

MANCHESTER 1824

Search q Welcome: MSASSMP6 Meik Poschen Madam Group Logout  
Data | Setup | Help

My Details Projects Metadata

Create / Modify Attributes Created / Available Folder Types Created / Available Templates Groups I belong to

Cancel Delete Save

<input type="checkbox"/>	Name	Units	List of Values	Creator	Group
<input type="checkbox"/>	Chemical	mols	1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Country		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Decay Weight		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Description		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Dig Site		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Est Date		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Find Type		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Found by		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Genre		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Geometric Mean		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Goeyness	yucks	1 2 3	Meik Poschen	Madam Group
<input type="checkbox"/>	Instrument		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Journal		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Location		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Method		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Sample type		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Shelf Level		1 2 3	Simon Collins	Madam Group
<input type="checkbox"/>	Shelf Life		1 2 3	Simon Collins	Madam Group

Help  
Page Help

Folder Type  
Create Type

Templates  
Create Template

Group  
Create Group

# MaDAM and eScholar








Manchester eScholar Services have the mission to

- “sustain and enhance the research reputations of individuals and organisations affiliated with The University of Manchester”
- “enhance the global research community's ability to access The University of Manchester's research outputs”

For the MaDAM project eScholar will

- provide a resolvable end point for publishing of data to the wider research community
- be a searchable archive for MaDAM data allowing the University to meet its retention commitments

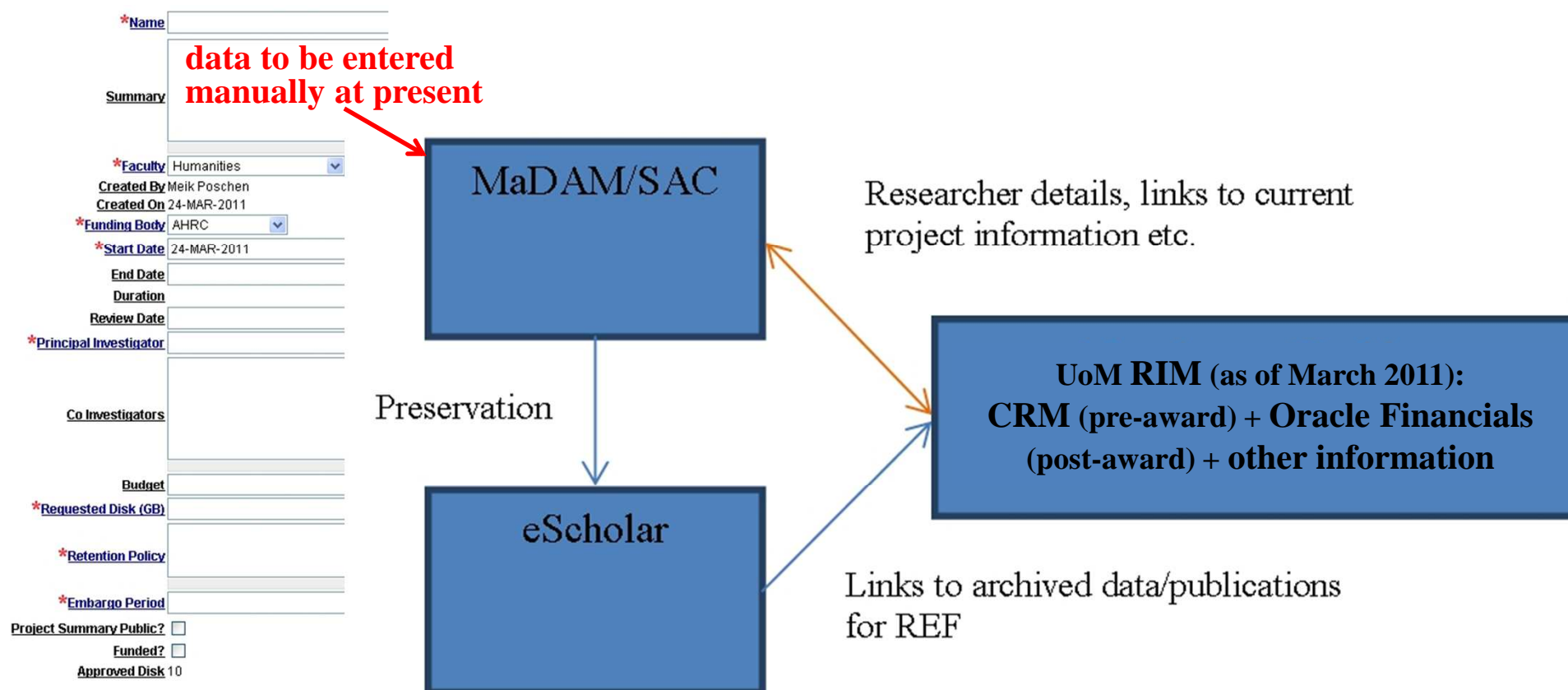
My eScholar login

-  **store, manage and preserve** your journal articles, books, working papers and other intellectual assets in a digital form
-  **deposit fulltext files and comprehensive metadata** to maximise the impact and potential of your research findings
-  **capture/import metadata** from external databases e.g. PubMed, EndNote, Reference Manager
-  **"Lite-cite" submit** your publication details for later editing and display
-  **display and maintain a bibliography** of your publications on your personal and other websites, *coming soon!*
-  **access, cite, bookmark and share** your scholarly work, *coming soon!*
-  **create a list of publications** for a CV, a report for a funding body and other administrative tasks, *coming soon!*



# Integrating Research Information Management Data

- MaDAM is currently exploring the integration of UoM RIM data (auto-retrieval)
- UoM's RIM environment itself is in the process of being linked more seamlessly



# Challenges & Observations (1)

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Existing institutional and faculty support for researchers – including IT Services, Research Offices and people managing the core facilities and scanners – directly and indirectly contribute to research data management.

Engagement of these support structures will be essential to policy development and are critical to sustainability in terms of both buy in and the potential for capacity building in their services.

A cultural change is/might be needed for the proper support of domain specific data management plans, research practices and research management policies in general, and this, inevitably, will take time (and won't be easy!). High level institutional support is crucial, too!

# Challenges & Observations (2)

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- Making the best use of pilot users' limited time
- Managing the expectations of UoM and external interested users
- Ensuring that solutions would fall inline with working practices
- Dealing with a diverse & fragmented landscape (policies, funders)
- Engagement of institutional support structures is essential
- The use of Research Data Management within the actual Working Practice is evolving – emerging patterns and behaviour:

How much storage will research groups/researchers need over what time – how long has data to be kept in an active or easy accessible state for reuse or sharing?

How will the relationship between new policies and research practices develop?

How will dissemination practices and hence Scholarly Communications develop or change?



# Transition: from MaDAM to MiSS

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- MaDAM: successful in addressing the needs of its user groups and in developing a pilot infrastructure, which is live, maintained and actively utilised by its pilot user base.
- Madam's outputs & findings (researchers' benefits) together with being part of an initiative for a sustainable University-wide Research Data Management Service helped secure funding for the successor project MiSS (MaDAM into Sustainable Service).
- MiSS (MaDAM into Sustainable Service) will be building on MaDAM, although it is more a transitional project than a continuation which will move the pilot into a sustainable service within the University's new technical framework at the end of its lifetime in March 2013.

# Picking up from MaDAM..

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..in MiSS on endeavours started but not completed/evaluated within pilot's lifetime/remit:

- Researchers' dissemination practices...
- ...and full integration of eScholar (MaDAM: proof of concept)
- Automatic population of research information data (accounting, grants)
- Enabling better metadata ingestion from different sources in various disciplines (via community input)

# Delivering MiSS

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## **MiSS will be delivering a service which will include**

- 1) Rebuilding and integrating the MaDAM technical service infrastructure, making it more generic but tailorable (domain/discipline specific plug-ins/plugin points),
- 2) providing a Research Data Management Policy (incl. DMPs), along with a supporting Service, and
- 3) integrating with the necessary human infrastructure, addressing needs across UoM.

# MiSS User Community

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For the domain specific user community the project includes five research groups covering all four faculties.

Academic Champions in

- Life Sciences
- Engineering and Physical Science
- Medical and Human Sciences
- Humanities/applied quantitative social research

We will furthermore set up a user committee open to all research disciplines at UoM to balance specific with generic needs.

# MiSS Challenges

- Bridge between and cater for generic and specific needs, making the RDML easy usable but open enough for specific tools and automated data ingestion by providing 'plug-in points'
- Integration with the Manchester Technical IT Services infrastructure, which is evolving concurrently (Manchester Working Environment, MWE)
- Balance researcher, internal and external research data management needs and policies (research cultures & work practices, University structure with research offices & faculties and funder requirements)
- Beware scope-creep and keep all stakeholders in line towards delivering a RDML Service in March 2013

# Many Thanks!

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## **MaDAM**

<http://www.merc.ac.uk/?q=MaDAM> (outputs)

<http://www.library.manchester.ac.uk/aboutus/projects/madam/>

## **MiSS**

<http://www.manchester.ac.uk/miss/>

@MISS\_RDM

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meik.poschen@manchester.ac.uk

<http://www.merc.ac.uk/?q=Meik>