Data Management Planning for Secure Services (DMP-SS)

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Funding bodies increasingly require their grant-holders to produce and maintain Data Management Plans (DMPs)
- bid-preparation stage
- after funding has been secured

Funder Rationale
- help the study team manage research data
- identify specific factors that may promote or limit data sharing.
- justify the resources and funding required
- clarify individual and institutional roles and responsibilities.
- helps peer reviewers by:
  - data quality, security, confidentiality and sharing;
  - information-related risks management.

Where are the service providers?
Institutional role and responsibility

- **Typical Data Management eco-system**
  - Central Information Services
  - Local departmental Information Services
  - Cloud service (rapidly emerging)

- **Related institutional services**
  - Estates and facilities management
  - Human Resources
  - Research Services
  - Finance
  - Communications & Media Services
  - ......
DMPOnline Developed by UK Digital Curation Centre

1. Uses a ‘checklist’ approach;
2. Assists with the creation and maintenance of Data Management Plans;
3. Provides guidance on data management issues and how to meet funders’ requirements;
4. Exports attractive and useful plans in a variety of formats.
Public health DMP

- How can we construct a reusable data management planning framework for public health data?
  - Use existing standards
  - Provide added value
  - Support the research data life-cycle
  - Promote best-practice in data management

- Are there already suitable standards?
  - Process Standards (Process Model) ✓ ISO-27001
  - Structural Standards (Data Model) ✓ DDI
Information Security Standard

ISO-27001:2005
Information Security Management Systems

International standard for information security

ISO-27001:2005
Describes requirements (i.e. what you ‘shall’ do)
Independently audited

Associated code of practice

ISO-27002:2005
Provides guidance (i.e. what you ‘should’ do)

An ISMS is dynamic
Information Security Management System (ISMS) Development

**PLAN**
- Management Support
  - Define ISMS Scope
  - Create Asset Register
  - Risk Assessment
  - Risk Treatment Plan
  - Statement of Applicability

**DO**
- ISMS Implementation Programme
  - Create ISMS
  - Stage 1 Audit
  - Stage 2 Audit
  - ISO-27001 Certification

**CHECK**
- Compliance Review
  - Corrective Action

**ACT**
- Corrective Action Procedure
ISO 27001 controls taxonomy

The standard proposes a taxonomy of **controls** and associated **assurance mechanisms** that may be applied by an organisation to reduce the risk to specified **information assets**.

<table>
<thead>
<tr>
<th>ISO 27001:2005</th>
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<tbody>
<tr>
<td>Security policy</td>
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<tr>
<td>Organization of information security</td>
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<td>Asset management</td>
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<tr>
<td>Human resources security</td>
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<td>Physical and environmental security</td>
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<tr>
<td>Communications and operations management</td>
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<tr>
<td>Access control</td>
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<tr>
<td>Information systems acquisition, development and maintenance</td>
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<td>Information security incident management</td>
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<td>Compliance</td>
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The DMPOnline checklist to describe use of **data assets** within a research project with reference to specific **controls** and **assurances**

<table>
<thead>
<tr>
<th>DCC Question</th>
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<tr>
<td>Introduction and Context</td>
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<tr>
<td>Data Types, Formats, Standards and Capture Methods</td>
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<td>Ethical and Privacy Issues</td>
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<td>Access, Data Sharing and Reuse</td>
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<td>Short-Term Storage and Data Management</td>
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<td>Deposit and Long-Term Preservation</td>
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<td>Adherence and Review</td>
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<td>Statement of Agreement</td>
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<td>Annexes</td>
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Metadata Standard

DDI V3 (LIFE-CYCLE)
What is DDI?

- **Data Documentation Initiative (DDI)**
  - XML metadata specification
  - Describes the study, datasets, supporting docs & other external resources
  - DDI Alliance

- **DDI version 1.0-2.1 (codebook)**
  - Focus is on the archive / preservation / dissemination
  - Has been around since 2000.
  - Widely used and tools available

- **DDI version 3.0-3.1 (life-cycle)**
  - Encompasses the entire survey life cycle
  - Initial version released in 2009.
  - Early adoption stage and tools in development
DDI ‘life-cycle’ standard

DDI 3 research data life cycle

Concept
- Initial concepts
- Questions and answers
- Grant info

Collection
- Questionnaire
- Coded instrument
- CAI metadata
- Paradata

Processing
- Data specs
- Recodes
- Summary descriptive info

Distribution
- Terms of use
- Citation
- Packaging info

Discovery
- Catalogue record
- Indexing
- Related publications

Analysis
- Replication code
- Publications

Archiving
- Preservation metadata
- Confidentiality
- Additional processing

Repurposing
- Post-hoc harmonisation
- Data transformations

Metadata descriptors of data management process.

..... from conceptualisation through to archival.
Pull everything together

DMP-SS ARCHITECTURE
DMP-SS Project  Data Management Planning for Secure Services

DMP Online Object Model

Research Data Management Planning System
- Plan Repository
- Plan Editor
- Plan Search

Information Security Management System
- Asset Register
- Controls
- Risk Register
- Assurances
- Document Management System
Objectives

- Develop the necessary functional components for an ISO-27001 compliant ISMS
  - asset and risk registers
  - controls and assurance records
  - document management system
- Create a local DMP repository service by extension of the DDI 3.x standard to accommodate elements of the DMP object model.
- Develop suitable web-services from the local DMP repository to allow for search and retrieval of data management plans contained within the repository
Relationship between DMP and ISMS

Start

Create Initial Plan

Identify Information Assets

Identify Risks

Finalise Plan

End

Data Management Planning

Information Security Management System

Database & Document Store

Information assets

Asset Register

Risk Register

Risk Assessment

Risk Treatment Plan

Risks

Controls & Assurances

Controls & Assurances
Implementation Strategy

Research Data Management Planning Tool

- Metadata-driven DMP Editor & catalogue
- Extension of existing DDI3 editor
- Open Source
  - OpenMetadata Framework
- Adaptable
  - Compatible with DCC, US ....
  - Multi-context
- Web-services
  - Link to DMP Online
MRC guidance on data management plans

From 1 May 2012, all applicants submitting funding proposals to the MRC are required to include a Data Management Plan as an integral part of the Case for Support for an application. MRC Institutes and Units are

- DMP editor available to all applicants
- DMP catalogue & ISMS available to all institutions
- Create relevant DMP profiles
Summary

- Structured, extensible data management planning framework
- Compatible with DDI and ISO27001
- Reusable and sharable metadata record
- Use of DDI-compatible records is in line with MRC, Wellcome, ESRC and other major international funders aspirations.

Joint Statement of Purpose

Key messages

- Data management plans must be devised in conjunction with local service providers
- Use standards where possible
- Information Security is fundamental

Integrated Research Data Management Planning

[http://blogs.ucl.ac.uk/dmp-ss/]