# Chapter 19
# The Minimum Mandatory Metadata Sets for the KIM Project and RAIDmap

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## ABSTRACT

*A Minimum Mandatory Metadata Set (M3S) was devised for the KIM (Knowledge and Information Management Through Life) Project to address two challenges. The first was to ensure the project's documents were sufficiently self-documented to allow them to be preserved in the long term. The second was to trial the M3S and supporting templates and tools as a possible approach that might be used by the aerospace, defence and construction industries. A different M3S was devised along similar principles by a later project called REDm-MED (Research Data Management for Mechanical Engineering Departments). The aim this time was to help specify a tool for documenting research data records and the associations between them, in support of both preservation and discovery. In both cases the emphasis was on collecting a minimal set of metadata at the time of object creation, on the understanding that later processes would be able to expand the set into a full metadata record.*

## INTRODUCTION

Between 2005 and 2013 the University of Bath was involved in a series of linked projects aimed at improving knowledge and information management in engineering. The first of these went by the title 'Immortal Information and Through-Life Knowledge Management: Strategies and Tools for the Emerging Product–Service Paradigm', though that was colloquially abbreviated to 'Knowledge and Information Management Through Life' and thence to 'KIM'.

The KIM Project was a Grand Challenge project funded by the Engineering and Physical Sciences Research Council (EPSRC) and the Economic and Social Research Council (ESRC) in the UK (Ball et al., 2006). It ran for three-and-a-half years and involved 11 universities and numerous industrial collaborators. One of the purposes of the KIM Project was to experiment with new ways of working on engineering projects in order to increase efficiency across the lifecycle, and to improve the long-term usability of the project records. This being the case, the project incorporated some of those ways of working into its own governance and processes as both a test and a demonstrator. For example, all project files were given a coded file name that indicated the work unit to which it belonged, the type of document, the initial creator, and the version, but did not reveal the content. Instead, researchers were expected to embed the title in the document properties, and a separate registry was maintained that decoded file names into document titles.

One of the methods used to protect the longevity of the project records was to impose a Minimum Mandatory Metadata Set (M3S) for all project documents. Researchers were required to embed the specified metadata in the documents they created. The intention was to use it, alongside regular file properties and information supplied at the collection level, to generate a complete set of preservation and descriptive metadata for each document. In order to reduce the burden this would place on researchers, document templates were written that used the embedded metadata to fill out content on title pages, headers, footers, and so on. As mentioned above, additional metadata was encoded in the file name convention.

Even though the focus of the KIM Project was on knowledge and information management within industry, some aspects of the work had wider applicability. Therefore, when the Joint Information Systems Committee (JISC) of the UK further and higher education funding councils set up a programme to fund projects tackling various challenges in the area of research data management (RDM), the University of Bath took forward some of the ideas from KIM and applied them to academic research in the course of two much smaller projects.

ERIM (Engineering Research Information Management) developed a set of RDM processes for the Innovative Design and Manufacturing Research Centre at Bath, including a technique for visualizing the inter-relationships between the various records generated by a research project. The latter technique, known as Research Activity Information Development (RAID) modelling, was based on UML activity diagrams and could be used to trace the results published in a paper back to raw data files or further back to project plans (Ball, Darlington, Howard, McMahon, & Culley, 2012).

The follow-on project REDm-MED (Research Data Management for Mechanical Engineering Departments) generalized these processes for use by the Mechanical Engineering Department – in consultation with a parallel project setting up RDM support across the university – and by engineering departments in other universities. The project also developed a software tool called RAIDmap to aid in the creation of RAID diagrams.

In the event the digital RAID diagrams produced by RAIDmap were much richer than the purely graphical diagrams developed by ERIM. They were capable of storing metadata records for each node (file, instrument) in the diagram, populated partly automatically and partly manually. Indeed, the vision for RAIDmap was that it would monitor the user's workspace and automatically add nodes and metadata to the diagram as the user worked; the user would periodically fill in any gaps in the metadata and note relationships between nodes. The question naturally arose of what metadata users should be asked to provide themselves, and what the best practice should be for providing it: embedding it within the document or entering it manually into RAIDmap. To that end, the idea of a Minimum Mandatory Metadata Set was revisited.

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