# Digital Asset Management Education and Training

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## Abstract

*Within the cultural heritage sector, we are witnessing rapid growth in the volume and complexity of digital materials, both digitized and born digital, so that the management of these digital assets is now a significant activity. In government, both local and central, and in commerce and industry, more and more of the information created in the normal course of activity is in electronic form. If the full value of these assets to the economy, society and culture is to be realized it is essential that fully trained professionals are available to ensure their management, curation, and use. This paper uses a new postgraduate MA programme at King's College London as a case study to explore the issues affecting the design, implementation and delivery of formal education and training for Digital Asset Management.*

## Introduction

We are all aware that digital media, techniques and technology are of increasing importance. In 2005 Lynne Brindley, CEO of the British Library, commented that

*"Most people are aware that a national switch to digital broadcasting is expected by the end of this decade. Less well known is the fact that a similar trend is underway in the world of publishing: by the year 2020, 40% of UK research monographs will be available in electronic format only, while a further 50% will be produced in both print and digital. A mere 10% of new titles will be available in print alone by 2020."* [1]

However, it is not only published material that is making a transition to digital media. Every field of scholarship is subject to enormous individual and institutional change. Word-processed reports, extensive databases, digital photographs, audio and video recordings, electronic publications, through to complex combinations of information sources stored in databases, Geographical Information Systems (GIS) and sophisticated on-line digital resources are all key 'documents' in the majority of organizations and all require on-going archive management. Digital media, whether on-line or within an institutional setting, are seen as being an increasingly important part of the core business, research, recording, information dissemination, and 'public facing' roles of organisations. Within the cultural heritage sector we are witnessing rapid growth in the volume and complexity of digital materials, both digitized and digitally produced (or 'born digital'), so that the management of these digital assets is now a significant activity. In government, both local and central, and in commerce and industry, more and more of the information created in the normal course of activity is in electronic form, whether as web publications, images, databases, GIS files, data sets, email, or documents in word-processed, spreadsheet or PDF formats. If the full value of these assets to particular organisations or the wider society, culture, and economy

is to be realized it is essential that fully trained professionals are available to ensure their management, curation and use. For example, in the case of museums digital objects and the technologies that surround them, unlike the physical objects and sites that they describe, do not fit easily into the museum curators traditional knowledge and skill set. They offer new possibilities for researchers and powerful tools for engaging with a larger community of the public (whether physically present in the museum or in the virtual world) but these opportunities require careful informed thought and the application of a substantial body of new professional knowledge and skills which must be acquired in some way. This raises two questions: Firstly, how are the various professions involved in curatorial activity to respond to these new challenges so that the increasingly complex demands that they make on staff can be built into their core competencies? Secondly, where can existing staff acquire professional training to extend their skill and knowledge base? A quick study of the top recruitment website for specialist careers in academic, research, and science (www.jobs.ac.uk) shows that there is a rapidly growing demand for suitably qualified applicants for posts that involve the words 'digital asset' and 'curation' in their job titles or descriptions. How are the professions to ensure a supply of suitably qualified applicants for these new posts? Indeed, is there any agreement about what warrants a 'suitably qualified' candidate and what it is that is required to produce them? A similar phenomenon can be found in the 'Museum [Insider]' site which provides 'inside information about museum projects, services, training, and potential business for anyone involved in the museum and heritage industry in the UK' [2]. A study of the rising number of invitations to tender that require a substantial component of digital work discussed there is a persuasive argument in favour of a formalization of professional training in digital asset management.

The comments above show the need for some sort of education and training programme but they also hint at the need to establish a definition of what is required of digital archive professionals. There is a need to build a community of practice that can oversee the development of new guidelines, standards and practices. The Digital Preservation Coalition is an example of one of the organisations that is working towards this aim, in their own words 'to enable and act as a catalyst to support its members to ensure long term access to and management of their digital assets; to collaborate with our national and international partners to take forward the digital preservation and asset management agenda; and to act as a broker and an agent of knowledge transfer amongst its membership' [3]. The emergence of formal educational qualifications is also a key part of this process. Such programmes of education will help to define Digital Asset management as an area of skilled activity, and perhaps help it to indentify itself as a distinct new professional role. Initiatives such as JISC's Digital Preservation and Asset Management Programme [4] identified the need for appropriate training and led to the provision of short

courses, for example, the Digital Preservation Training Programme (DPTP) at the University of London Computing Centre [5]. What is discussed in this paper is a longer, one year full-time or two year part-time, postgraduate level Master of Arts (MA) degree programme which is the first of its kind in the UK.

## Designing an MA Programme for Digital Asset Management

Although there are specialist courses in different aspects of producing and managing digital assets, and some excellent programmes in digital preservation, there is little offering a more formal qualification at a post-graduate level. How does one begin to address this apparent gap in professional education and training? Starting at a general pedagogic level there are two areas of importance that have to be addressed in any programme of education

- The selection and design of appropriate course *content*.
- The use of a variety of *teaching methods* that equip the students with an appropriate mix of theory, practical and management skills

A new MA programme at King's College London addresses these issues to provide education and training with a specific focus on those seeking employment in library, archival and curatorial activity (in both the public and private sectors). The MA Digital Asset Management programme equips students to work in a variety of professional contexts within the cultural heritage sector and elsewhere wherever digital assets are managed. The longer term aim is to develop other parallel programmes geared to other areas of digital asset management expertise at King's College London (for example, in managing medical records). However, we are initially concentrating on areas of expertise within the Cultural Heritage sector which are present the two departments who are collaborating to deliver the MA ; the Centre for Computing in the Humanities (CCH – soon to be renamed 'Digital Humanities Department') and the Centre for eResearch (CeRCH). The MA is focused around the 'digital resource life-cycle', from creation through management, access and dissemination to long-term preservation, including standards, legal issues, web2.0, semiotics and semantics, and project management. It is designed to equip students with the necessary critical and reflective capacities, set within a thorough grounding in the theory and practice of digital curation. Students also gain a great deal of practical hands-on experience, working on real problems and digital collections throughout the course. To that end, much of the teaching takes place in a new digital laboratory which provides access to innovative working spaces and technologies that will support the learning process.

Turning to the question of *content*, what is it that needs to be taught by such a programme? The National Initiative for a Networked Cultural Heritage (NINCH) *Guide to Good Practice in the Digital Representation and Management of Cultural Heritage Materials* [1] states that Digital Asset Management (DAM) involves

- Creating an efficient archive that can hold digital resources (such as images, audio and text) and the metadata that describe them;
- Implementing an infrastructure to ensure that these electronic data are managed and preserved in such a fashion that they will not become obsolete;
- Implementing search facilities that enable users to identify, locate and retrieve a digital object.

It also states that the benefits of implementing DAM include:

- Centralizing discovery and access;
- Coordinating disparate projects as part of a coherent whole;
- Centralizing authorization, security, and tracking systems;
- Unifying organizational solutions to managing copyright and IPR;
- Reducing duplication of effort and resources;
- Saving time for the creators and users through organizational structure and centralization of data.

A study of these benefits reveals that a suitable programme of education requires more than simply a knowledge of certain academic content and practical skills in digital preservation; there is a requirement for management skills together with strong analytical and interpretive skills.

The MA Digital Asset Management programme is jointly taught by the Centre for Computing in the Humanities (CCH) and the Centre for e-Research (CeRch) at King's, building on their combined expertise in digital resource modeling and creation, information and knowledge management, digital curation and preservation, and repository infrastructures. Their close collaboration with research partners within the major cultural institutions of the UK provides the background and focus for the design of the programme and ensures that it provides a robust and practical response to the skills shortage currently affecting the management, exploitation and long-term preservation of digital assets in both the public and private sector.

The statements in the NINCH document together with the experience of our staff and project partners, provided a starting point for the design of the content of our MA programme. However, the intention from the outset has been that the programme would be primarily for the training and Continuing Professional Development (CPD) of active practitioners or those engaged with the field but wishing to move in digital asset management for career development. This necessitated careful thought about not just the academic content but also the skills that would be taught and, more importantly, *how* the programme could be taught in ways that equip students to perform a variety of professional roles upon completion. The teaching styles therefore encompass lectures, seminars, practical exercises, site visits, student seminars, intensive use of case studies and an assessed internship module. The programme culminates in a dissertation project involving the application of digital approaches or techniques in some area of digital asset creation, management or curation, this is an opportunity to engage with research in the subject at a deep level, frequently in a 'real-life' case study.

## The Structure and Content of the Programme

The programme comprises of two compulsory modules

- *Introduction to Digital Asset Management*
- A dissertation

and additional modules that may be selected from

- An Internship
- *Digital Preservation*
- *Digital Repositories and Information Structures*
- *Metadata Theory and Practice*
- *Digital Ecosystems*
- A range of more discipline specific modules such as *Digital aspects of the Material Culture of Archaeology* and many others drawn from related programmes.

### Introduction to Digital Asset Management

This compulsory module is at the heart of the MA Digital Asset Management programme. It provides a broad overview of key ideas and information, covering the range of challenges, processes and technologies in the design, creation, documentation, publication, management and preservation of digital assets. As well as acquiring a great deal of practical knowledge, we want students to develop their critical and reflective capacities, and to acquire an understanding of the inter-dependence between the developments in digital scholarship, technology and curatorial practice. The module is structured into four themes; creation, publication, management, and preservation. These themes are used to explore a broad range of issues including the development of strategies and policies, technical frameworks and tool, standards and metadata, resource design, and copyright and digital rights management.

### Dissertation

The individual project and dissertation is a compulsory part of the MA in Digital Asset Management programme. Each student undertakes a research project in an area related to one or more of the elective courses they are taking. Each student will be assigned a supervising member of staff who will monitor the project and seek out relevant collaborations, where necessary and possible, within the departments, institutions and organisations participating in the programme.

The project may involve theoretical and/or practical work. For a largely theoretical project, a dissertation of 10,000 words is expected. For a project involving a significant amount of practical work, the dissertation element may be smaller, e.g. 5,000 words. The details are agreed on an individual basis, and depend on the particular project and the amount of practical work involved.

### Internship

The internship module expands the teaching methods to include work-based study. This is seen as an important part of the programme as it complements the theoretical and historical approaches taken in the compulsory and other supporting modules. It allows students to observe and analyse first-hand an organisation in the cultural heritage sector (or other aspect of digital asset management) while gaining work experience and developing transferable skills. Where relevant the work placement may also feed into dissertation research, possibly with the host organisation serving as a case study. Internships have already been used within our other MA programmes with considerable success and we have developed many very productive partnerships with host organizations and companies. Currently this is not a compulsory module but it is strongly recommended to the students. The equivalent modules in our other programmes have proved to be very popular and highly effective.

The use of extended project work and work-based learning is a particular interest of the departments offering the MA Digital Asset Management. The management, progress, and assessment of these two modules is itself part of the on-going research of the current director of the programme [7].

### Digital Preservation

This module provides students with the necessary knowledge and skills to ensure that they are able to understand, evaluate, and apply the various approaches to preserving digital materials. It explores the theory informing preservation policies and examines a variety of preservation methods and models. Students examine a number of case studies and 'real life' examples of preservation practices and challenges which are representative of the current application of preservation methods to a variety of data types, including texts, images, sounds and multi-media . Students develop critical skills for assessing the relevance of different approaches to digital preservation in different contexts through the application of analytical, interpretive and communication skills.

By the end of the module students have a deep and systematic understanding of the theory and methods informing digital preservation policies and an understanding of the application of a variety of preservation methods across a range of digital object types. They are able to apply these methodologies to their own work within the cultural heritage sector and elsewhere. Having developed a critical awareness of the process of developing preservation policies they will be able to analyse complex areas of knowledge in order to preserve digital assets in a range of domains.

### Digital Repositories and Information Structures

The core of this module is an understanding of the importance to digital asset management of various approaches to modelling and representing information, and the role of digital repository technologies in implementing these approaches. The module includes an overview of the current state of the art in the field, and will address a range of theoretical perspectives and methodological approaches. It also presents a number of case studies, based on real-life examples from work with researchers and archivists within KCL, which are representative of the current applications of digital repositories to a broad range of digital assets. In this way, we build an understanding of the process of developing digital repository and information management systems. Students develop critical skills for assessing the relevance of different approaches to representing information in specific contexts. This will extend to

the application of digital repository methodology and systems across the areas of digital asset management, digital libraries and archives, and open information spaces.

### *Metadata Theory and Practice*

This module provides a detailed overview and practical experience of metadata approaches and schemas used in digital archives and digital libraries. The module provides an overview of the state of the art within the field and addresses a range of theoretical perspectives and methodological approaches, drawing on practice in libraries, archives and cultural heritage organisations. Through a mix of lectures and practical seminar work students become familiar with key metadata standards and their application. Students gain an in-depth familiarity with the key metadata models including METS, MODS, and PREMIS and develop critical skills for assessing the relevance of different approaches to representing information in specific contexts. The difference between descriptive, administrative, structural and technical metadata are studied and students gain an understanding about a variety of metadata standards, including the communities they came from, their overall rationale, how they are structured and the context in which they might be applied. The key metadata standards for a variety of digital object formats and an appreciation of the importance relative merits of each are explored. The module involves practical experience of generating metadata using a variety of tools, and an appreciation of the problems associated with integrating standards and how these may be overcome. The meaning of semantic web and how it differs from conventional approaches to web resources together with an understanding of the concept of ontologies and how they differ from taxonomies are examined.

### *Digital Ecosystems*

This module aims to provide an understanding of the potential contribution of a Linked Data approach to digital asset management, digital ecosystems and open information spaces. This is achieved by building up knowledge of the process of developing open digital information ecosystems. Students develop critical and reflexive skills for assessing the relevance of Linked Data approaches to digital scholarship, e-research and corresponding technology platforms. An ability to apply these methodologies to work within the cultural heritage sector and elsewhere will be developed as well as a critical awareness of the process of developing open digital information systems to manage digital assets in a range of domains.

### *Modules from other Related MA Programmes*

One of the partners in the programme, the Centre for Computing in the Humanities, has had many years experience of operating other related MA programmes in *Digital Humanities* and in *Digital Culture and Technology*. Students on the MA Digital Asset Management may choose modules from these two programmes. Available modules include:

**Digital Aspects to the Material Culture of Archaeology** provides both an overview and a highly practical understanding of how computing is affecting and changing the ways in which the material culture of archaeology is studied. The module provides a systematic introduction to the specialised key computational methods and techniques that have been derived from theoretical research-based work in this discipline as well as new approaches that are at the forefront of the discipline. It focuses in particular on the application of computing knowledge and skills to document and communicate the epistemic aspects of archaeological artefacts. It aims for the students to gain practical skills and insights in key disciplinary methodologies of each area covered, especially of the application of new techniques and database design and manipulation for archaeological finds. It aims to provide students with a comparative understanding of key curatorial issues across the discipline areas, including descriptive and administrative metadata, tools for managing digital object repositories, display and exhibition (including virtual reality) and preservation. Above all, the module aims to develop the capacities of the students for analysis, synthesis, and critical reflection on the ways in which digital methods are applied in the study and curation of material culture.

**Digital Art and Culture** which gives a grounding in the interaction between digital technologies and the study and practice of art. It draws on the established methods of art analysis and interpretation and demonstrates the effects of digital techniques and tools on Art History. The module includes an overview of the field to date, and an introduction to a range of theoretical perspectives and methodological approaches to the perception, production, representation, analysis and interpretation of visual material. The classes include case studies representative of current applications of digital technologies in art practice, preservation and scholarship. The aim of the suggested preparation work and gallery visits is to enhance students' visual perception and appreciation of real artefacts, while the lectures, recommended reading and assignments will engage further with contemporary digital culture and the virtual object.

**Structured Data in the Digital Humanities** takes a computational perspective on problems in the arts and humanities disciplines. These frequently involve the design of a data structure from relatively unstructured records or from those whose given structure does not readily yield the kind of information required by the researcher. Once the structure has been designed and perfected, it is filled with data abstracted from the records and often normalized in the process. The resulting database is then repeatedly manipulated until patterns emerge from it. This module places particular emphasis on information analysis, and database design, construction and manipulation focusing specifically and at length on analysis of suitable problems in the humanities and to design of database structures that best handle them. The key stages of analysis and design, from systematic and discriminating data gathering to conceptual and physical modeling will be explored and applied to a variety of source material. The scholarly and technical database methods covered in this modules are directly relevant to all fields in which complex tabular data feature as primary source material, e.g. history and other historical disciplines such as art history, archaeology, philological literary studies, linguistics and the curation of cultural heritage. The

lectures will be directly in support of work on specific case studies. Throughout students are made aware of the strong interpretative element in the modeling of data.

The modules described above are just three examples drawn from twelve modules offered by the Centre for Computing in the Humanities on its other MA programmes. Students may, if they wish, select modules from other departments to broaden their outlook.

## Conclusion

The management of digital content, realising its value, ensuring its curation and the management of this life-cycle are the core subject matter of the MA programme in Digital Asset Management. We want students to acquire a great deal of practical knowledge, but even more we want them to develop their critical and reflective capacities, and to acquire an understanding of the inter-dependence between the developments in digital scholarship, technology and curatorial practice.

The design and implementation of the new MA programme has given us an opportunity to reflect on the current state of the community and the needs of staff working in the area of digital asset management. It is hoped that this work, together with that arising from the ongoing progress of the MA, will provide an opportunity for us to make a significant contribution to the building of a community of practice for digital asset management in the UK.

Details of the MA Digital Asset Management programme are available at http://www.kcl.ac.uk/schools/humanities/depts/cch/pg/madam/

## References

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## Author Biography

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