

EDRM System Implementation Toolkit

Stage 1: Positioning

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Stage 1: Positioning – where does it fit?

Reason for stage

This stage is designed to help the project team agree exactly what they mean by an EDRM system. It is also designed to help the team see how the new system will integrate with their existing IT systems and applications. Finally, step three is also designed to show how an EDRM system procurement should be seen as part of an overall information and records management programme within the education organisation.

Definition of stage

Stage 1 comprises three steps.

- Step one defines what an EDRM system is – what it is designed to do and what variations of system exist with different acronyms and how they vary in scope and function.
- Step two positions EDRM systems alongside other IT systems and applications within your education organisation.
- Step three reviews best practice guides for operating an information and records management programme.

Objectives of stage

Reading this stage an experienced EDRM project team should be able to decide whether or not they fully understand the type of system they want to implement and how it will integrate with their existing IT systems and applications.

This stage can help a novice project team appreciate exactly what an EDRM system is – what it is designed to do – what variations of system exist with different acronyms and how they vary in scope and function. It also helps to position EDRM systems alongside your other existing IT systems and applications. Finally it reviews best practice guidelines for information and records management so the team can assess their current policies and procedures and systems prior to planning their EDRM project.

Step One – what is an EDRM system?

An EDRM system is designed to manage semi-structured or unstructured content including text, graphics, image, audio and video content. The content can be managed as individual content objects or brought together to form documents. Simple documents are made up of one content object (a text file or an image file). Compound documents are made up of two or more content components.

A subset of the documents managed in an EDRM system can be declared to be records and are then managed as records using a more stringent set of business rules which are designed to preserve the integrity, content and context of the record.

A simple definition of an EDRM (Electronic Document and Records Management) system is that it is a system designed to manage electronic content, documents and records and support four key functions:

- input (creation/capture)
- management (content, documents, records)
- collaboration/process management
- output/delivery.

In other words an EDRM system represents a combination of an active electronic content and document management system and an electronic records management system.

You will find a historical guide to the evolution of these systems in stage one, step one ([link to Historical background](#)) below. Then sub section [Deciding which functions you need](#) ([link to Deciding which functions you need](#)) provides you with some advice on how to decide which functions you need.

Historical background

Paper records

Fifty years ago we managed virtually all our information on paper. Some calculations were done on mechanical devices but the resulting data was recorded on paper. We typed information onto paper to create documents and if we needed to amend a document we tended to mark up the changes manually on the paper and then retype the whole document.

The first business computers were large costly devices that were shared to process data in applications such as payroll processing and accounts. The resulting data was output to paper in the form of lengthy reports or ledgers.

Microfilm

The first real challenge to paper was the introduction of microfilm. Large users of paper such as government departments and banks would gather the paper in folders and when a folder became closed they would move the folders offsite to lower cost storage. A new alternative from the 1960s onwards was to microfilm the pages using a range of microfilm cameras. The advantage was that thousands of pages could be stored on a small roll of microfilm or on a thin microfilm jacket. So over time many organisations opted to film their documents as they became older in order to save space but microfilm was not really suited to the management of active documents.

Word processing

The second change to the technology was when we started to use computers to process textual data. A new range of word processing equipment came on the market in the late 70s and early 80s. We started to produce correspondence and other documents on word processors but in general the aim was still to print the document onto paper and file the paper document in a folder containing incoming paper correspondence and outgoing word processor produced documents. However, many organisations decided to store electronic copies of standard text documents as well so they could reuse standard templates etc so we started to move to a hybrid paper and electronic world in the office.

Records management software

Organisations also started to use computer databases to manage index data relating to paper folders. Government departments started to use "registry" or "records management" software that assigned a unique number to each folder and folder part held and a range of additional index data including title; subject; owner; when opened; when closed etc. These systems could be used to track folders and check them in and out of a registry like library books into and out of a library. So the first records management software was introduced to manage records held as paper documents in paper folders.

Office software

Over time as personal computers arrived on our desktops we used them to create a wider range of documents including text documents, spreadsheets, CAD designs and graphics. Suites of office software were introduced by companies such as Lotus and Microsoft and the cost of computer storage reduced and the volume of data that could be held increased dramatically. The PCs were networked to facilitate access to shared resources such as mass storage, printers etc. Teams of users would set up shared directories so they could all access their electronic documents.

Document image processing (DIP)

In the late 1980s we saw the introduction of scanners that could scan and digitise images of paper documents, photographs etc and hold them as a digital image. This plus the introduction of lower cost digital storage and laser printers led to a situation where instead of microfilming paper documents when they became inactive we could scan incoming paper documents and manage them in an electronic folder on shared computer storage throughout their life.

The tide had started to turn. For ten to fifteen years we had been creating a growing proportion of documents on computer systems but had still printed them out and filed the "master" paper copy in a paper folder. This was referred to as a "print to file" policy. The main reason for this had been that the folder also contained incoming paper documents. The only way we could see incoming and outgoing correspondence together was as paper documents in a paper folder.

With the arrival of affordable scanning we could suddenly start to regard an electronic folder as a master folder and could simply save our electronic documents into the folder and scan and digitise our paper documents and save them in the same electronic folder.

Electronic document management (EDM)

By the mid 90s we saw imaging integrated with the management of electronic documents in a new range of Electronic Document Management systems.

Initially these systems managed each document as a file and linked the file to a database record for that document. The metadata was held in a relational database and if documents shared common metadata attributes you could group them together in a folder.

Most of the systems were geared to managing active documents – either incoming paper that needed to be captured and routed to someone to process or new electronic documents that were created as drafts, annotated, edited and then issued as approved documents. The suppliers were not targeting the long-term records management market and so government users continued to manage their formal records in paper folders on records management systems.

Content management (CMS)

As time moved on the software used to create documents got more sophisticated and we saw the introduction of the World Wide Web. Suddenly electronic publishing moved from being a niche market to become a mass market. Instead of just managing documents more and more organisations realised that they needed to manage the "content" of their documents at a lower level. They needed to hold the components of a document – the text, the graphics, the images etc – in a form which allowed them to reuse those components to create other documents.

The name coined to describe this new generation of sophisticated management systems was "content management" systems. Documents were marked up using languages such as SGML and HTML and XML and the components or content objects were managed in a content library.

Of course, for legal reasons it was still vital to know which components appeared in which document on a certain date so within a content management system you can still manage content at the content or component level; at the document level and at the folder level.

Web content management (WCM)

A number of suppliers developed systems that were only designed to manage content for publication on web sites and they called those systems Web content management systems. They can best be seen as a subset of content management systems.

With WCM systems you can either create content using office software, scanning etc and then transform the content into html or other approved web formats or the creators can be provided with browser-based templates for content entry. The content is structured to follow approved publishing styles. WCM systems provide content versioning facilities and the facility to assign metadata to content and manage the content in a repository just like content management systems. WCM systems offer integrated content approval workflows to control the review and approval of content and ensure it is passed for publication. Crucially, WCM systems support the publishing of content across intranets and the Internet. WCM systems offer facilities to design new web sites and support content personalisation to cater for specific audiences. WCM systems provide administration functions to track the status of content and monitor the usage of web sites etc.

Electronic records management (ERM)

In parallel with the move to content management we also saw the introduction of Electronic Records Management software. This came from two directions. Firstly, the suppliers of paper records management software looked at the development of EDM systems and started to adapt their software to manage not just paper folders but a mix of paper folders; electronic folders and hybrid folders where one part could be paper and another part electronic. Secondly new suppliers came in with folder based ERM software that included records management facilities.

Users in government and large regulated industries were interested in this new ERM software but were also somewhat cautious. Where were the standards and how could they use these systems to manage both paper and electronic folders in future? There was also an internal problem in that the records managers in most organisations did not control the IT department and hence were in no position to dictate to their IT department which software they should roll out to all the users.

The first attempt to standardise ERM functions was made by the US Department of Defense. Their "Design criteria standard for Electronic Records Management software application" outlined some of the key functions that any ERM software should provide and was used as the basis of a test

programme to test and approve software as being DOD compliant.

In the UK in the late 1990s the then Public Record Office—now the National Archives (TNA)—worked with the Central Computing and Telecommunications Agency—now Office for Government Commerce (OGC) and a number of government departments to define a set of "Functional Requirements for Electronic Records Management Systems". The result was a standard published in 1999. The PRO also set up an approval programme and some fourteen to fifteen suppliers were approved against the 1999 standard for a period of 2 to 3 years. We had a standard for ERM systems and this was followed by a further standard sponsored by the European Union called MoReq (Model requirements for the management of electronic records) which was more international in scope and not limited to the public sector. It also added a number of key additional requirements.

Finally, in 2002, the National Archives issued a second version of their requirements which was more prescriptive and included a number of significant new requirements based on three years of experience of working with departments to implement approved solutions – "Functional requirements for ERMS 2002". By June 2004 some 6 suppliers have been approved by the National Archives and some 17 are going through the approval process.

Electronic document and records management (EDRM)

While the requirements for ERM have been defined the industry has been busy working on compliant software. Experience led many public sector bodies to conclude that what they needed was a combination of an EDM and an ERM module to provide a seamless solution. Initially the suppliers were offering loose integrations between EDM and ERM solutions. The problems with that were that often users had to save the same document into two folders. After a flurry of mergers and acquisitions and a lot of development effort most suppliers now offer integrated solutions. The preferred term for systems which manage active documents and provide the core records management facilities are EDRM systems.

However, it is worth noting at this point that some of the suppliers of EDRM solutions offer electronic document and content management facilities and ERM facilities but others are only offering a narrower set of electronic document and ERM facilities. The former can support all the electronic document and content management and Web Content Management facilities described above. The latter support just the document management facilities. This is an important distinction to bear in mind when you move into the procurement stage.

That nearly concludes the historical background. The last requirement is to bring you up to date with the terminology. As outlined above the trend is very much one of merger and acquisition so that a smaller number of larger suppliers can offer users a suite of software that will manage content from cradle to grave – from capture/creation through to controlled destruction – and support all the functions that are increasingly needed by large user organisations.

Enterprise content management (ECM) suites

The term EDRM was adopted by some suppliers who merged EDM and ERM functionality and is widely used in the public sector. Hence it is the term used by JISC and Cimtech for this toolkit. However, as indicated above, there were really two categories of EDRM supplier – those who also supported content management/WCM facilities and those who did not.

The industry has therefore seen the need to invent an even more generic title – Enterprise Content Management – to describe those suppliers who are building a comprehensive suite of software designed to support EDRM functions plus the full range of content management and collaboration and business process management functions.

This is a confusing area. We have tried to give you an indication of the functional differences between an EDM, CMS, WCM,ERM, EDRM and ECM suite. However, there is nothing to stop a supplier adopting whatever title they like for marketing reasons so just because someone says they are the leader in content management it does not follow that they can provide content management facilities any more than it actually guarantees they are "the leader".

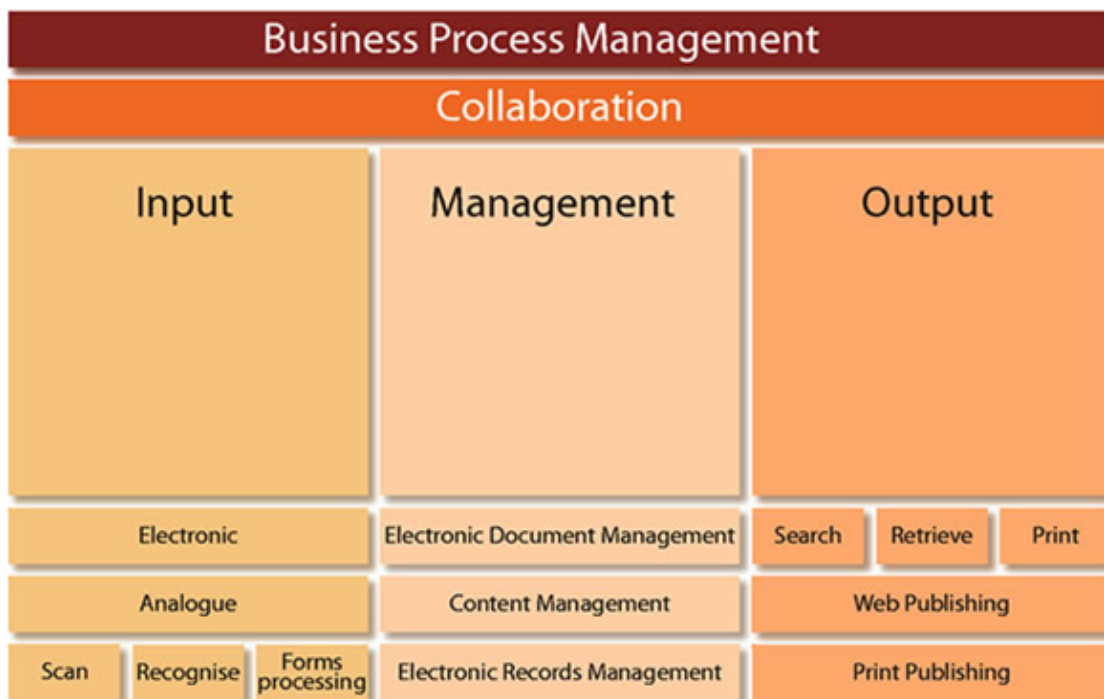
As a project team the only sure way is to review all the functions and facilities available and draw up a list of which are mandatory; which are highly desirable and which are optional and then get a preferred supplier to contract to the supply of the required functions and facilities.

The next sub section provides a review of the key functions and facilities so that once you have reviewed your education organisation's requirements at stage three. you can then decide on the preferred mix of functions for you in stage four and specify them in your statement of requirements in stage six.

Deciding which functions you need

We review the functions under four main headings:

- Input (capture/creation)
- Management (content, document and records management)
- Output (delivery, distribution and disposal)
- Collaboration/business process management.



Input

In order to manage your content you need to provide facilities to capture electronic content and analogue (paper, film etc) content and associated data for indexing or for loading into other databases etc.

Electronic capture

When we talk about electronic capture we usually mean the system is integrated with the software

applications we use to create content so we can create content and save it into the system where it will be managed for us. Examples include interfaces to office suites so we can save word processing documents, spreadsheets and Powerpoints into the system plus interfaces with other applications so we can save CAD files and graphics files and e-mails and attachments into the system. In short every electronic content object. In content management applications this will include content entry via browser-based templates to impose structure and Web publishing styles.

Increasingly electronic capture also includes the ability to capture electronic content and data created on other business administration systems or other third party content management systems. This includes the ability to capture content created on finance or HR applications or student administration systems or from third party web sites and other content management systems. Increasingly the interchange format that powers this interchange is XML. It also includes the capture of data via electronic forms and, where required for legal purposes the capture of an image of each electronic form.

Analogue/paper capture

In most cases then in addition to capturing electronic content you also need facilities to capture content held on paper or film or in other analogue formats by digitising it. You will need a document and data capture subsystem to scan and digitise analogue content and to provide you with facilities for capturing data from the documents for indexing (metadata) or for loading into other databases if you are capturing forms etc. The data capture can be done automatically or semi automatically or manually.

There are a number of options when it comes to capturing paper documents and data. The following represent five options that you should be aware of.

- Document image capture
- Document image and unstructured full text capture
- Document image capture and structured forms processing
- Document image and semi-structured data capture

Document image capture

The first option is the traditional document image processing requirement. The systems allow you to scan paper documents or microfilm images or slides etc and capture digital bitonal, greyscale or colour images. They provide facilities for keying in metadata or for capturing metadata from a barcode on the document and facilities for checking the quality of the captured image and metadata, rejecting and rescanning or rekeying. They provide facilities for loading the image and metadata onto your management system.

Most users will need to scan office documents up to A3 size but the subsystems also support large format scanners that scan documents up to A0 size or larger. You may also need to scan microfilm formats or 35mm slides etc. In this core application the only recognition software that tends to be supported is bar code reading. This is still the biggest market for document and data capture. Increasingly, however, users are now looking to move on to more sophisticated subsystems that can capture the text of a document or the data held on a form. Manually keying data from an image is very labour intensive so any system that can reduce the effort involved in data capture should be looked at carefully.

Document image and unstructured full text capture

The next step up once you have captured the image of a page of a document is to attempt to recognise all the text contained on that page using recognition software.

There are a number of reasons why users need to do this. Firstly they may be in a publishing environment where having captured a document they want to edit it and reformat it prior to publishing.

Secondly, users may want to be able to search on the full text of the document. Hence they need to recognise the text and load the text into a search engine.

The key factor about this application is that the text that is being captured is unstructured. It could be in any format. The software is not using any document template to recognise specific document formats – it is just looking at images and trying to identify text characters.

Document image capture and structured form processing

The next major application is structured form processing. Here traditionally the user wishes to scan the images of one or more standard forms and to then capture data from defined positions on the form where users have been asked to write in variable data.

The definition of a form may range from simple cheques or credit card vouchers up through double-sided A4 forms and onto 20 page forms in the case of Census forms.

Key to this traditional forms processing application is the fact that the forms are designed for data capture and are printed as turnaround documents. The user knows that they are going to be sending a form or forms out to customers which the customers then complete and send back for processing. The user wants to reduce the cost and increase the accuracy of the data capture process by designing the form to facilitate scanning and automated data capture.

The user is therefore prepared to design the form so that it is optimised for automated data capture and the form design can be pre-defined to the document and data capture system. The form template is defined to the system so it knows that when it scans an image with those characteristics it is required to look at various boxes and other areas on the form and capture whatever variable data is recorded in those areas of the image.

The benefits of such systems are that when well designed they can deliver fast and low cost and accurate data capture plus archive images so the paper forms can be destroyed.

The disadvantage of such systems is that it takes a long time to design the forms and any change to the design of the forms leads to major system changes which are time consuming and costly. Such systems only work with well-defined turnaround documents printed in high volume.

Document image and semi-structured data capture

The next application is a newer application area designed to address the requirement for users to capture data from a range of forms which they do not produce and hence they do not control.

This market is trying to address applications where all the documents to be processed share common characteristics but differ in detail. Examples would be supplier invoice processing where invoices share common characteristics but differ in the exact areas where the supplier number or the line item data may be held on each different invoice. Another example would be direct debit

forms from different gas or electricity regions where there will be some similarities but some differences.

Management

Any system you procure will need to provide you with core management facilities including the ability to store the content files and the ability to link metadata to the files and use the metadata to search for and retrieve the files and control who has access to the files etc. The management systems provided by suppliers will vary based on whether their system is set up to manage simple documents only (EDM) or whether it can manage at the content and document level and support content re-purposing for multiple delivery media (CMS/WCM) and whether it also supports records management facilities.

The approach we take here is to review the electronic document and content management facilities together first and then go on to review specific electronic records management requirements. If you are looking at an ERM system only then you will also need many of the electronic document and content management facilities.

Electronic document and content management

Some Electronic Document Management systems only support a simple model inherited from document imaging of a document comprising one or more pages in the case of a scanned document or one file in the case of an electronic document.

All true content management systems should support simple and compound documents. Compound documents are documents that comprise multiple components. You would have a container document and then multiple content components. Components could comprise text files; graphic files; tables; images etc. You might need a different application to create and edit each component and then you needed to bring them together to create the master document. In sophisticated systems the container document is marked up and the other components tagged to the container.

Another feature of a content management system as opposed to some electronic document management systems is that the content management system manages at a lower level – it manages the objects or components or content that go to make up documents. The rationale is to help organisations exploit and reuse their content to create more documents. However, increasingly what most users need to do is manage at both levels – the content for editing and publishing and the document to support business processes and provide a record of transactions etc.

Another key differentiator is that a content management system is designed to keep the content separate from the delivery mechanism or the presentation format. With a document imaging or document management system you have no choice about how you view the document – you see an image of a page in an image viewer or you see the native text in a word processor etc.

With a content management system the content can be marked up using SGML or HTML or XML and then you define, using a style language, how you want that content to be rendered on one or many delivery devices. The delivery device can be a PC screen; a WAP phone screen; a PDA screen; a piece of paper etc. If you are in a publishing application you can optimise the presentation of your content for each delivery mechanism.

Hence a content management system treats content like data in a database. The content is held in a neutral format and marked up so it can be reused as an asset in a number of different ways. Some systems are actually called digital asset management systems.

At present the most popular delivery mechanism is via an internet or intranet or extranet web site and a user's browser. However true content management is designed to transcend any one delivery mechanism. Systems that are geared exclusively to the Internet are best referred to as Web Content Management Systems.

For most users it is the Internet that is driving their interest in becoming publishers and hence in content management but many large organisations in the publishing business have been implementing what are effectively content management systems for many years. They have been capturing text and graphics and images and managing them on content management systems and then developing output applications that will assemble the content to form compound documents and render them on paper, microfilm, CD ROM or the Web.

Both EDM and content management systems must provide users with the ability to attach metadata to a document/content object, to register each document/content object and log the document/content object into a repository; to apply check out and check in procedures and version control facilities so document/content objects cannot be overwritten and to apply document/content object level security so only authorised users can access and read the document/content object and only a subset of those users can edit the document/content object.

EDM and content management systems allow users to use a mix of structured index data and full text indexing to provide a flexible range of searching and retrieval options.

Electronic records management

EDM and content management systems were designed to manage all the documents and content held by organisations but the main focus was on managing those documents and content objects and providing access to them while they were new and active and while they were being edited.

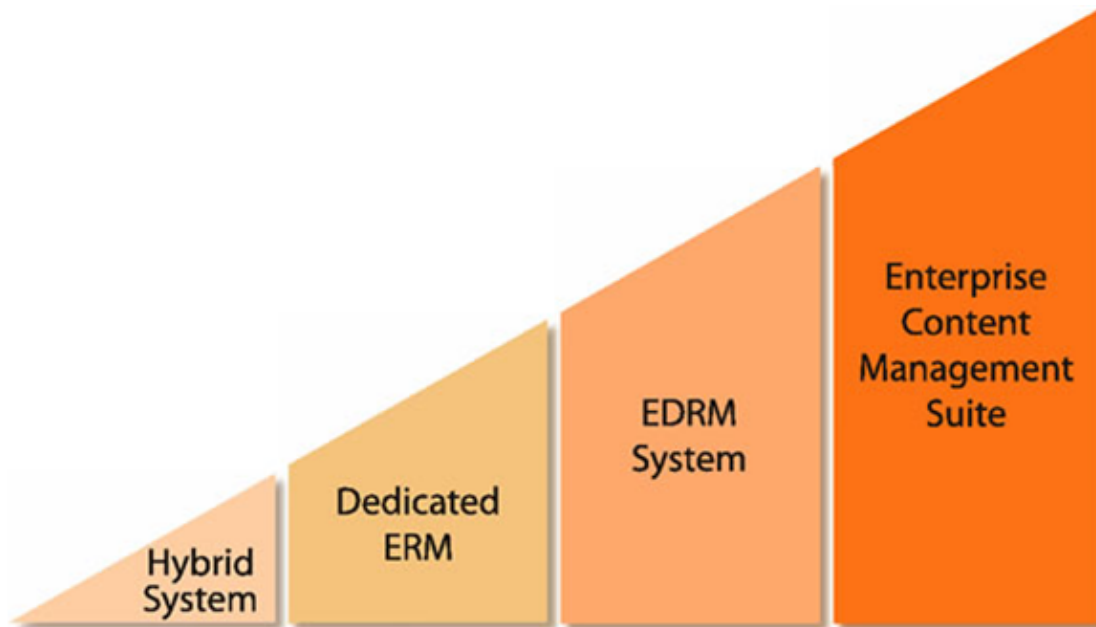
There was much less attention paid to how they would be managed over the long term and how they would be preserved and eventually disposed of.

As described in the historical background section above, public sector bodies need to manage a subset of their electronic documents as records and need to be able to apply records management controls to them. To address this requirement the US Department of Defense, the National Archives in the UK and the European Commission have all defined requirements for ERM.

The core functions which must be supported to meet the National Archives ERM requirements include the following:

- They must support a corporate classification scheme and file plan i.e. a hierarchy with at least three levels or classes. The hierarchy comprises the classification scheme, classes, folders, parts, records, documents and content components.
- They must support declaration, i.e. a subset of all documents/content objects will be declared as records and will then be frozen and protected and preserved throughout their life.
- They must support disposition, i.e. the ability to define how long records should be retained for; when they should be reviewed and after review when they should be destroyed or transferred for long-term storage

There are basically four approaches to implementing Electronic Records Management.



The first is to run a hybrid system. Paper records are still held in folders and registered on a records management software package. Electronic documents are held in folders on shared drives and the folders are linked to the metadata held for the paper folders on the records management system. This is very complex and labour intensive and is now largely only used as a transition to full ERM.

The second is to put in a dedicated ERM system. This is typically used in organisations with no EDM or ECM systems. They manage electronic documents on shared servers and incoming paper in paper folders. Then when a project is complete or at an agreed point the paper is scanned and the digital images indexed in digital folders on the ERM system and the digital documents are saved into the same folders. The result is a corporate ERM with folders held for all the main topics covered by the organisation. The problem with this approach is that the organisation does not get the benefit of active EDM/ECM and there are no controls over what users place in the ERM folders.

The third approach is to implement an integrated EDM and ERM system referred to as an EDRM system as described above.

The fourth approach is to implement a full Enterprise Content Management suite that comprises EDM plus ECM plus WCM plus ERM plus collaboration and BPM facilities.

In the medium term, ERM will just be a module supported by all document and content management systems.

Output

All EDM and content management systems should provide users with facilities to view, print, fax and save to disk selected content/documents. They should also allow users to attach content/documents to e-mails and send them as attachments.

Content management and web content management systems should support the delivery of content via Internet, extranet and intranet web sites and user browsers. They provide facilities to support the development of web sites. You need facilities for the development of content-based Web applications, supporting both code and content elements. You need to create Web pages that are reusable and index and manage them in the repository alongside the content. One of the key functions of a WCM system is that it can be used to check all the links between pages and content

and hence guarantee the integrity of all the links within a specific website.

A web content management system will support the use of templates. A Web designer can then create and edit templates which are applied to the content submitted by authors to ensure the content on a web site follows a house style. WCM systems support workflow and processes designed to pass content from authors to editors where it is reformatted or transformed ready for publishing and where it is reviewed and approved for publishing on the Web. The approval process is ideally controlled via a flexible workflow management package.

The core function supported by all Web content management systems is web publishing or delivering approved content to the correct live web server and ensuring that the correct content appears on the right site in the correct format. This can be a static or dynamic process. WCM software will also monitor the usage made of content and incorporate archiving software for pulling inactive content off a web site.

A WCM system will also provide personalisation software which allows the content to be personalised to meet the needs of the individual who is searching the Web site. There is a developing range of personalisation options available which range from translating content into different languages, selecting content that suits the age and level of expertise of a user, reacting to user expressed preferences etc.

Sophisticated WCM systems should provide tools that address the needs of multiple web site deployments. These simplify issues such as synchronisation, localisation, branding and content delivery. You may be creating content that is to be delivered on the corporate Web site, the corporate Intranet and on an Extranet. The content may be customised, reformatted etc for each site. All this should be automated as far as possible as soon as the content is approved for publication.

A true content management system should support multiple delivery channels so content can be captured and indexed and managed and then processed and delivered to multiple channels including paper publishing; Web site publishing; publishing via mobile devices; publishing on DVD etc. One of the key features supported by content management systems is assembly – the ability to assemble a document from all its component content objects and render it on screen or on paper or however it is required to be rendered in future.

Most education organisations are major publishers in their own right so it would seem likely that education organisations would need a system that can support all of the above output options.

Collaboration /Business process management

Collaboration

Increasingly an Enterprise Content Management suite will also include a suite of collaboration software

Collaboration suites consist of a number of software programs and functions to facilitate human interaction over electronic networks. Core functions can include:

Function	Description
Calendaring/scheduling	Shared diary services for scheduling events, meetings etc
Whiteboarding	Software for freehand drawing and pen-based writing on handheld computers or other mobile devices
Instant messaging	Real time, text-based peer to peer communications over the internet

E-mail	Asynchronous text based communication across a LAN or the internet
Presence detection	The ability to see if other users, on a pre selected list are online concurrently
IP telephony	Links IP telephony with other collaborative functions so users can phone a colleague's number and set a calendar event
Web conferencing	Online shared meeting facilities on the desktop or as part of a group conference
ELearning/eTraining	An online education or training program that can be on demand or set to a pre-determined date and time.
Document/content management	facilities to create and share content including office suites and applications, shared drives and Windows shared services plus full EDM facilities so staff can manage the content creation collaboration process and control access to content and rights and permissions over editing, annotation etc.
Knowledge management	Makes corporate information available to all wherever it is based – includes search tools/portals
Digital asset management	supports storage, retrieval and reuse of digital objects such as images, video and audio and provides rights management facilities

There are two main decisions to make.

The first is – do you need a separate collaboration tool in addition to an EDM solution with a business process management tool?

If the answer is yes because you need to support the informal communications and document sharing facilities which a collaboration package offers then the second question is do you purchase a collaboration suite as part of your enterprise content management suite from the supplier of that suite or do you already have a collaboration tool in which case you purchase an EDM system that interfaces with that collaboration environment.

It should also be clear that many of the collaboration functions listed above will result in the creation of new content, a subset of which will need to be caught and declared as records. This reinforces the need for any collaboration suite to be closely integrated with the EDM solution.

Workflow/business process management (BPM)

As we move towards electronic business or e-business, education organisations need to have all their vital corporate information (data and content and documents and records) available electronically and they also need software to model and control and automate the way staff and systems operate to effectively run their core business processes.

Traditionally education organisations would document their processes in procedure manuals and staff would be trained to follow those procedures and supervisors and junior managers would be employed to ensure that staff followed the procedures and that work flowed through the processes.

The "work" usually entered the process in the form of a paper document – an order form, an enquiry, a complaint, an application for a place on a course, an application for a job etc. It was then tracked through all stages of the process by manual record keeping or computer software.

Such systems were very labour intensive to track and work had to be processed in a linear way as the paper document could only be in one place at one time.

The advent of document capture and EDM systems meant that the "work" could be digitised and hence could be accessed by multiple staff simultaneously if required.

To build on this and help staff cooperate more effectively to manage business processes, suppliers developed a range of collaborative software.

You can identify a hierarchy of process management or collaborative software products starting with e-mail and moving up to collaborative software and then to workflow management systems which are themselves evolving into a new range of business process management software.

Business process management software is used where organisations need to control complex processes that involve the cooperation of different users and systems and multiple steps or tasks which need to be carried out in a particular sequence and in a consistent way to achieve the required business objectives.

Here is one definition of a business process management system:

"Integrating people, data and enterprise applications in efficient, adaptable and automated processes".

Most education organisations will use business process management software to redesign and automate their business processes to manage change and ensure that their processes better meet business objectives. They will start with a strategy; define their business objectives; select the processes to be improved and automated; model and redesign or improve those processes to better meet those business objectives; enact them using business process management software; measure the results; analyse the results and then go back and further improve the processes or reconsider the strategy.

The software needed includes process modelling software and the business process builder; the engine which is the enactment software; administration software to track the workflow/business process and create reports and the user interface software which determines how users interact with the business process management software.

The process modelling software ranges from diagramming tools such as Visio through to sophisticated simulation tools and software that allows you to cost certain design decisions, etc. The engine increasingly stores the business rules in a standard relational database engine.

A business process is defined to the business process management system as a procedure made up of a series of steps, each of which comprises a number of tasks. Each time the procedure is invoked a case or work item is created. At any time there are hundreds or thousands of cases being processed and each case will be at its own point in the procedure and will have its own status.

The administration software facilitates the task of tracking cases and producing reports to show new work entering the system and work completed, etc. Important features include the ability to set priorities or deadlines for cases and alarms to alert you to the fact that certain cases are in danger of not being processed within an agreed service level etc. In order to initiate tasks on a time rather than an event basis triggers can be defined to start execution of a task at predefined or calculated times. Chasing or sending reminder letters is a case in point.

As indicated above, most business processes involve the creation or use of documents or both. Hence, many business process management systems are designed to interface with EDRM systems. Many EDRM suppliers bundle some business process management software in with their products but these tend not to be as powerful or flexible as some of the leading third party products.

The EDRM process management software is geared at "document/content-centric" processes such as collaborative authoring; sending out draft documents for approval; publishing content to a web site, etc. The production business process management products will tend to offer more

sophisticated tools to interface with business administration systems and support parallel processing.

Checklist of Functions

This table lists the four key high level functions your education organisation will require from a system (Input; Management; Output and Collaboration/Business process management) and then lists a series of optional detailed facilities under each function. Your team can use this table to enter in your requirements and give them a priority rating of (mandatory; highly desirable or optional).

If you tick document capture; EDM and ERM and Business Process Management requirements you should opt for an EDRM solution. If you also ticked content management and multiple delivery and web content management and collaboration requirements you should opt for an Enterprise Content Management suite.

	Function	Description	Do you need this function?	Priority(Mandatory; Highly desirable; Optional)
1	Input			
1.1	Electronic capture			
1.1.1	Electronic content/document capture	Facility to capture electronic content/documents created via standard office software applications		
1.1.2	Electronic content creation via template	Facility to create content via a browser form which imposes structure and style for web publishing.		
1.1.3	Electronic document/data capture	Facility to capture electronic documents/data created via line of business systems and other business administration systems		
1.1.4	Electronic forms	Facilities to design electronic form, publish form, capture data via form , validate data according to business rules and load data into application and capture image of form if required		
1.1.5	E-mail capture	Facility to capture e-mails and attachments and management of them as documents/records		
1.1.6	Content transformation	Capture of content and editing/conversion of content into format suitable for Web publishing		
1.1.7	Import of electronic content/documents held as single electronic files	Facility to import text documents; XML documents; spreadsheets; e-mail messages; PDF documents; document images; vector graphics etc.		
1.1.8				

	Import of compound documents as a single record	Facility to import multimedia documents, CAD files, directly interlinked documents; sessions from collaboration systems etc		
1.2	Analogue capture			
1.2.1	Scanning and digitising analogue content	Facility to scan and capture digital image and key in metadata		
1.2.2	Scan and digitise and text capture	Facility to scan and capture digital image and recognise and capture textual content		
1.2.3	Scan and digitise and forms processing	Facility to scan and digitise and analyse image data – recognise that image contains image of a specific form side template and then process structured form image to extract data from fixed positions on template		
1.2.4	Scan and digitise and semi structured data capture	Facility to scan and digitise and process semi-structured form image for data capture		
1.2.4	Scan and digitise and raster to vector	Facility to scan and digitise map or design and convert raster to vector data for processing		
1.3	Metadata capture	Facility to enter metadata and associate metadata with a document/content file to facilitate control and retrieval		
1.4	Categorisation	Facility to classify content/documents into categories based on content/rules		
1.5	Declaration as a record	Facility to define status of document to be a record at input stage so it is then managed as a record		
2	Management	Electronic content, document and records management		
2.1	Electronic content and document management	Electronic content and document management functions		
2.1.1	Electronic content and document management	Manage documents as single electronic files in a repository		
2.1.2	Electronic content and document management	Manage compound documents comprising container documents and component content files in a repository		
2.1.3	Electronic content and document management	Manage the links between content components and container documents in a repository		
2.1.4	Electronic content and document management	Assign metadata (index data) to documents/ content objects and		

		register each document/content object in the repository		
2.1.5	Electronic content and document management	Manage metadata in relational database		
2.1.6	Electronic content and document management	Index full text of content in a full text engine to facilitate full text retrieval		
2.1.7	Electronic content and document management	Management of controlled thesaurus of terms		
2.1.8	Electronic content and document management	Provision of mass storage facilities including hierarchical storage management if required and content addressable storage if required		
2.1.9	Electronic content and document management	Mandatory provision of check-out and check-in facilities so document/content object cannot be overwritten – it can only be copied and then amended and checked back in.		
2.1.10	Electronic content and document management	Mandatory provision of version control facilities to ensure that edited documents can only be checked back in as next version of same document or as new document		
2.1.11	Electronic content and document management	Control access to metadata, content, document via access control markings, roles, groups etc.		
2.1.12	Electronic content and document management	Provide audit trail of transactions on documents		
2.1.13	Electronic content and document management	Solution must meet specified reporting requirements – all transactions on documents		
2.1.14	Electronic content and document management	System must support minimum usability requirements		
2.1.15	Electronic content and document management	System must be resilient, must maintain integrity of content objects/documents, must meet minimum performance requirements and must be scalable		
2.2	Electronic Records Management	Support TNA requirements as detailed below		
2.2.1	Record organisation	Classification scheme, classes, folders, parts and components		
2.2.2	Record capture, declaration and management	Declaration and management of records including metadata		
2.2.3	Retention and disposal	Disposal schedule definition; allocation and execution;		

		resolving conflicts, review and destruction		
2.2.4	Hybrid and physical folder management	Physical folders; markers; retrieval and access control; tracking and circulation; disposal.		
2.2.5	Authentication and encryption	Electronic signatures and electronic watermarks and encryption		
3	Output			
3.1	Search	Facilities to search all metadata; search full text content; save searches; present search results;		
3.2	Display	Facilities to display all content/documents/records captured and managed on the system irrespective of whether the application used to create them is present or not.		
3.3	Presentation	Facilities to present metadata and records to applications outside the solution in a form suitable for electronic publication		
3.4	Print	Facilities to print all types of content, documents and records which are printable in same way as they are displayed on screen		
3.5	Facsimile	Facilities to output content/documents to facsimile format and transmit it to defined facsimile numbers.		
3.6	E-mail	Facilities to attach content objects/ documents held in the solution to e-mail messages and send them to specified e-mail accounts		
3.7	Portal	Facilities to search and display content/documents held on the solution from within a named portal.		
3.8	Multi channel content delivery / publishing	Facilities to publish specified content to specified delivery channels using defined style sheets etc		
3.8.1	Print publishing	Facilities to publish specified content to print media using defined style sheets etc.		
3.8.2	CD/DVD publishing	Facilities to publish specified content on CD/DVD media using defined style sheets and software		
3.8.3	Delivery to mobile phones	Facilities to render content in format suitable for display on mobile phone screens using		

		defined style sheets and software		
3.8.4	Delivery to PDAs	Facilities to render content in format suitable for display on PDA screens using defined style sheets and software		
3.8.5	Internet/intranet/extranet Web site publishing	Facilities to render and publish specified content to specified Web sites using defined style sheets and web publishing software		
3.8.5.1	Web site development	Facilities to define and develop web sites using web content management software		
3.8.5.2	Develop web applications	Facilities to develop web applications using Web content management software		
3.8.5.3	Develop web pages	Facilities to develop specific web pages for use on a web site using Web content management software		
3.8.5.4	Check links	Facilities to check and maintain the integrity of all links made on a web site.		
3.8.5.5	Content approval	Facilities to route content through an agreed approval process using web content management and business process management software.		
3.8.5.6	Support multiple Web site deployments	Facilities to publish content to multiple web sites and synchronise process.		
3.8.5.7	Content personalisation	Facilities to customise content delivered to a searcher based on profile gathered of searcher		
4	Collaboration/Business process management			
4.1	Collaboration			
4.1.1	Calendaring/scheduling	Shared diary services for scheduling events, meetings etc		
4.1.2	Whiteboarding	For freehand drawing and pen-based writing on handheld computers, tablets etc		
4.1.3	Instant messaging	Real-time text based peer to peer communications over the Internet		
4.1.4	Presence detection	The ability to see if others on a pre-selected list are online concurrently		
4.1.5	E learning	An online education or training programme that can be on demand or set to a pre		

		determined date and time		
4.1.6	Knowledge management	Makes the education organisation's information and knowledge available to all wherever it is based – includes portals and other search tools		
4.1.7	Digital asset management	Supports storage, retrieval and reuse of digital objects and provides rights management facilities		
4.2	Workflow/ Business process management			
4.2.1	Business process modelling and building	Business process design and build tools to graphically model and redesign business processes and define them to the workflow engine.		
4.2.2	Business process management	A workflow/business process management engine which holds the business rules and controls the flow of each case or transaction through each step of the workflow/ business process		
4.2.3	Business process administration	Tools for administering the workflow/ business process including reporting and monitoring tools, audit tools etc		

Step Two – where does EDRM fit?

Step two is designed to show where an EDRM system or an ECM suite fits within your wider IT infrastructure. For simplicity we shall use the term EDRM to mean all the varieties of document/content and records management system described above.

As this toolkit is aimed at both non-technical records managers and IT professionals this step will inevitably represent a compromise that may seem very basic to some and too technical to others.

The IT world is a fast changing one and statements that everyone would have agreed with five years ago would now be ridiculed and easily contradicted. Nevertheless we will try and make some definite statements to try and position EDRM as it is mid 2004.

EDRM systems and relational databases

Generally speaking we can make a distinction between relational databases which are designed to manage structured data and EDRM systems which are designed to manage semi-structured or unstructured documentary information or content. We will look at some exceptions to that rule below.

Traditionally, therefore, education organisations use business administration systems based on relational databases to manage structured financial data in finance systems and structured personnel and payroll data in human resources and payroll systems and structured student data in student administration systems.

Traditionally, alongside those databases education organisations would also hold semi structured or unstructured content in paper documents in finance folders such as supplier folders; invoice folders etc and in human resource folders and in student folders.

If an education organisation then opts to implement a corporate EDRM system then the contents of those paper folders will be replaced by electronic folders managed in the EDRM system and the EDRM system will be interfaced with the Finance and HR and student administration systems so the data is managed in the Finance and HR and student administration systems and the content in the EDRM system.

Life is not quite as simple as that as increasingly recently the suppliers of Finance and HR and student administration systems have been expanding their solutions to allow users to complete electronic forms and text documents and scan in images of students and invoices and attach them to their database. In effect such suppliers are attempting to “document-enable” such systems.

This practice looks attractive to users in finance or HR or student administration departments as the interface is seamless. However, if this practice were adopted throughout an education organisation then we would end up with islands of automation. Electronic documents would be attached to administrative systems and could only be viewed by users of those systems and when the administrative system was replaced the documents would all have to be migrated onto the new replacement system alongside the data. In addition the documents on such systems are often not fully managed and protected. The link is just a file path which can become corrupted over time.

Generally speaking, therefore, if an education organisation is looking to implement a corporate EDRM system then they should look to manage all their core documents/content on the system and create links between the EDRM system and the prime administrative systems used within the education organisation.

So in future education organisations should aim to have one EDRM system and a number of core administrative systems and other databases.

This is not to say that the EDRM system and the administrative systems have to be supplied by different suppliers. Today and traditionally the leading EDRM suppliers have been specialist suppliers. However, increasingly suppliers of administrative suites such as Oracle and SAP are also moving into the EDRM field with their own offerings or with preferred third party offerings. So if you use Oracle for finance and HR you could also use them for EDRM in future but the EDRM solution they provided would also need to integrate with other databases.

EDRM systems themselves use relational databases to manage structured metadata so where tight integration is required with a business administration system it can be provided at the database to database level.

EDRM systems and your IT infrastructure

An EDRM system should be seen as a new corporate application like a new finance system or student administration system. It should be selected to run on your existing IT infrastructure. In other words it should run on your desktop PC hardware and software and across your networks and on your preferred server hardware and software. It should interface with the software you use to create content/documents and your existing e-mail and messaging software and, as shown above, it should integrate with your existing business administration systems.

Issues to consider

Upgrades

The first issue to consider is whether there are any weaknesses in your current IT infrastructure which may cause problems when implementing an EDRM system. The most common problem which education organisations face is if they operate across multiple sites and buildings then the network connections to remote locations may not be sufficiently powerful – the bandwidth may be too low to support the regular transmission of large electronic files. Hence in stage three a thorough review of the existing IT infrastructure is needed including a network survey. If this identifies network problems then in stage six – the requirements stage – you either need to specify an enhancement to the network or the system implementation must take account of the problem by either employing a distributed solution where all the documents required by that location are held locally on a server at that location or by delaying roll out to that location. Other weaknesses may include poorly specified desktop computers which need to be upgraded or non standard or obsolete e-mail solutions which may also have to be replaced.

Web content management

You may have decided after reading stage one, step one above that your preferred option is to implement an EDRM solution comprising – document and data capture; EDM; ERM and perhaps BPM modules. The reason may be because you already have either an inhouse developed Web Content Management solution or a third party package which you have invested time and effort in implementing.

This is a perfectly reasonable approach but it does leave you with some integration issues which need to be considered in stage three and solutions specified in stage six. Most notably this option will result in at least two content repositories (EDRM and WCM) and you will need to consider how you want to search across both and how you will want to declare some of the content on the web sites to be records and how you will want those records to be managed. The preferred approach in the medium term would be for all records to be managed on the EDRM system.

Business process management

Most education organisations will need some form of business process management tool to allow them to model existing business processes, re-design them and automate them taking advantage of the fact that the content is now available electronically. As indicated in stage one, step one above, there are really three options open to you. You could use the BPM module supplied with the EDRM system, you could use a third party BPM package which you perhaps already use or you could use a BPM package that perhaps already comes with your preferred business administration system, e.g. SAP, Oracle, etc.).

The best solution may be a mix and match solution. For structured business processes relating to student administration or finance use the BPM that comes with the administrative package if it is flexible and powerful. For document centric processes such as routing correspondence for action or approval or managing the approval of content for publication on the web site etc then use the BPM supplied with the EDRM solution.

Collaboration/knowledge management

If your education organisation already has a firm commitment to a portal product for providing a

single point of access to core corporate information or if your education organisation is already developing collaborative applications based on Share Point Portal Server or other collaboration software then you may have decided to implement the document capture; EDM; ERM and BPM modules but not the collaboration module. In that case you will need to ensure that you specify that the EDRM solution can be accessed via a portal and can interface with the preferred collaboration package such as Share Point. A number of EDRM solutions are specifically designed to interface with Share Point. Others are provided with their own collaboration software. Other IT issues are considered in stages three and six below.

Step three – best practice for information/records management

The third recommended step for any project team is to ensure that you view the procurement of an EDRM system in the context of an overall information and records management programme.

The experience of central government and the guidance provided by the National Archives and other bodies is that before embarking on a corporate EDRM procurement you should have an agreed corporate information and records management policy and a strategy for implementation. Indeed the procurement of a corporate EDRM system should be one project within an overall information and records management programme.

What such a programme should cover is reviewed in [stage two](#) as part of the guide to scoping and managing the overall programme/project.

In this step we simply provide a brief review to some of the best practice guides available to help you review best practice for information and records management policies and procedures and systems.

If you are looking for guidance to best practice for corporate information management we would recommend you start with [BSI DISC PD0010 – Principles of Good Practice for Information Management](#). It defines five key principles.

- Recognise and understand all types of information
- Understand the legal issues and execute duty of care responsibilities
- Identify and specify business processes and procedures
- Identify enabling technologies to support business processes and procedures
- Monitor and audit business processes and procedures.

If you are looking for specific guidance on records management then we would recommend you start with [BSI/ISO 15489 – 2001 Information and Documentation – records management](#). This international standard was issued in order to standardise international practice in records management using the Australian standard AS4390 as its starting point. Although it is now under review it is recommended reading if you are setting up a records management programme or if you need to audit your existing policies, procedures and systems prior to specifying your requirements for an EDRM system.

For a thorough guide to managing business information and records you should consult DIRKS (Designing and Implementing Recordkeeping Systems); [A Strategic Approach to Managing Business Information](#) (also known as the DIRKS Manual). This was produced by the National Archives of Australia and provides the definitive eight part guide to designing and implementing new record keeping systems.

For those of you primarily focused on good records management practice to assist with meeting the requirements of the Freedom of Information Act then we would recommend [Freedom of Information](#)

Act 2000; Lord Chancellors Code of Practice on the Management of Records under section 46 of the Freedom of Information Act (link to References and case studies section, item 7).

Your overall records management policy should include a specific policy on electronic records. Again the National Archives website contains a model Corporate policy on electronic records which can form a good starting point.

Last but by no means least there is the excellent set of guidance provided by JISC themselves specifically for the FE/HE sector. Pride of place goes to the JISC infoNet Records Management InfoKit (link to References and case studies section, item 9) available on the JISC InfoNet web site. Equally useful is the JISC (2002a) Model Action Plan for achieving compliance with the Lord Chancellor's Code of Practice on the management of records.

An extremely valuable resource for anyone following the DIRKS methodology and conducting an analysis of their business activity and drawing up a business classification scheme is the example Business Classification Scheme and Records Retention Schedule along with guidance produced by Elizabeth Parker.

Finally, further education organisations are referred to in the excellent report produced by Northumbria University for JISC, Developing records management in Further Education.

Stage two looks at how you should scope your programme/project and includes guidance on managing an overall records management programme that includes several projects of which the EDRM procurement project is one.

Deliverables from stage one

Stage one is largely a preparatory stage so it has a limited number of direct deliverables. However, the background information gained in stage one should feed into key deliverables required in stage two and in subsequent stages so this is a vital stage to work through.

After completing stage one the project team should have produced the following documents.

Step	Deliverable
1	A completed version of the table provided at the end of <u>stage one, step one</u> . Enter into the two blank columns whether you need each function listed and, if so, the priority you attach to them. Based on that outline the type of solution you think you need.
2	A brief positioning document indicating how you see EDRM fitting into your IT infrastructure and what issues you foresee based on your knowledge of the strengths and weaknesses of your IT infrastructure. Include in this a note of any other IT projects you are aware of that may overlap with the EDRM project. A new Web Content Management project would be one example as would a new Customer Relationship Management system.
3	A note of the key best practice documents which will be used to compare the current status of your records management policies, procedures and systems as part of stages three and four.

Resources required to complete stage one

The resource required for stage one depends on where the education organisation is currently.

For step one the team should attend courses on EDRM and read some of the documents listed in References and case studies section below. It may be helpful to invite one of the consultancy companies or course organisers in this field to come in and run a one day discussion session with you to go through the different types of systems and modules in more detail. They can also help in

step two to position EDRM alongside existing IT systems.

Otherwise for step two once you have a clear understanding of the type of system you need it will be important to have a representative from your own ICT department on the team to provide you with an up to date survey of the current IT infrastructure. The ideal composition of the project team is looked at in more detail in stage two.

For step three – if you have a records management policy and programme already underway then you will probably have copies of most of the recommended publications. If not then you should acquire them and again it may be worth attending a course that takes you through ISO 15489 and explains how to audit your current records management policies, procedures and systems.

Step	Resource estimate(days)	Description
1	10	Depending on how much research team has already done/ whether external consultancy used
2	10	Assuming team has input from ICT department
3	10	Less if already have a RM programme
Totalsteps 1 – 3	30	

Tools to complete stage one

There are no specific tools required or identified as available to help you through stage one other than those publications already mentioned and courses offered by the following organisations.

[AIIM Europe](#)

[Cimtech Ltd](#)

[The National Archives](#)

[TFPL](#)

[Northumbria University](#)

The one exception would be the outline table provided in the Checklist of Functions section. It can be useful to take and adapt that table by adding any additional functions you need and identifying the type of systems that can provide them. The table could be discussed and used in a one-day workshop.

Frequently asked questions

Question:

What is the difference between an EDM system and an ERM system and which do I need?

Answer:

An EDM system is designed to manage electronic documents while they are active. It does not support records management functions. An ERM system is designed to manage electronic records and supports all the required records management functions. However, it does not necessarily support active document management functions. Increasingly education organisations should consider an integrated Electronic Document and Records Management solution to manage their documents and content throughout the lifecycle.

Question:

Where does EDRM fit within my current ICT solutions?

Answer:

See detailed answer in [stage one, step two](#) above. An EDRM should fit alongside your database management systems with the EDRM managing documents and content and the DBMS managing structured data.

Question:

What do I need to do to check whether my education organisation is ready for EDRM?

Answer:

Check that you have a records management policy and review the best practice listed in the Best practice for [information/records management](#) and follow the guidance contained in stages two and three below.

Question:

Where can I obtain more information about the range of systems on the market?

Answer:

See the references in the Additional References and case studies section ([link to Additional References and case studies](#)).

Question:

What can we do if our education organisation cannot afford an EDRM system?

Answer:

You are asking this question very early in the process. You may be right but please follow the stages through to stages four and five. These describe how you should review the options available for improving your current records management policies, procedures and systems and how you can make the business case for the preferred option. The preferred option should, of course, be an option that your education organisation can afford and is prepared to budget for.

Hints and tips for stage one

1. Ensure you carry out stage one at the start of your project. It is important to have a clear idea of the range of systems available and the type of system you need before you start planning your project in detail and certainly before you start making a business case and planning the procurement.
2. Buy in some external advice and expertise in the form of publications, workshops and consultancy. Someone who has gone through all this before can challenge some of your assumptions and provide informed answers to your questions and give you the confidence that you have made the right decisions.
3. Ensure that you have reviewed or plan to review your current records management policies,

procedures and systems before commencing the procurement of an EDRM solution.

Additional References and Case Studies

Design criteria standard for electronic records management software application (version 19, June 2002) US Department of Defense, Washington 2002. DOD Directive 5015.2.

<http://jrtc.fhu.disa.mil/recmgt/p50152s2.pdf>

MoReq – Model requirements for the management of electronic records. CECA–CEE–CEEA. Bruxelles Luxembourg 2001.

<http://www.ispo.cec.be/ida>

Functional requirements for ERMS 2002. The National Archives.

<http://www.nationalarchives.gov.uk/electronicrecords/reqs2002/pdf/requirementsfinal.pdf>

For Project Management, as well as the infoKit the OGC PRINCE2 website has further details of the PRINCE2 project management methodology.

<http://www.ogc.gov.uk/prince/index.htm>

The OJEC website for details of EC procurement procedures

<http://www.ojec.com/>

The industry yearbook published by Cimtech provides a comprehensive list of all the main suppliers in each of the categories described in stage one, step one. It also provides a detailed management guide to the subject. Electronic document, records and content management: a comprehensive guide to electronic document, records and content management and a directory of products and services 15th edition 2004 Cimtech Ltd, University of Hertfordshire, College Lane, Hatfield, Hertfordshire AL10 9AB.

http://www.cimtech.co.uk/Main/Pub_EDRCM.htm

The DIRKS Manual, Steps A – D

<http://www.naa.gov.au/recordkeeping/dirks/dirksman/contents.html>

BSI–ISO 15489 – 2001 – Information and documentation – records management. Standards. BSI Customer Services 389 Chiswick High Road, London W4 4AL

<http://www.bsi-global.com/>

For modelling and redesigning business processes there are a number of useful reference works available as well as the Process Review infoKit. The following are three which we would recommend.

- Dave Chaffey. Groupware, Workflow and Intranets. Re-engineering the enterprise with collaborative software. Digital Press. Butterworth Heinemann. ISBN 1555581846. <http://books.elsevier.com/marketing?isbn=1555581846>
- Thomas M Koulopoulos. The Workflow Imperative – building real work business solutions. Van Nostrand Reinhold. 1995 ISBN 0442019750.
- Rosemary Rock-Evans. Data modelling and process modelling. 1992 Butterworth Heinemann, ISBN 0750607394.

For guidance on the conduct of records audits, the design of business classification schemes and retention schedules you are recommended to visit the National Archives website. <http://www.pro.gov.uk/recordsmanagement/standards/default.htm>

Magazines which contain useful case studies describing how organisations have successfully implemented an EDM or EDRM system include the following:

Managing information and documents MiD. Infoconomy Ltd, 17–18 Margaret Street London W1W 8RP. <http://www.infoconomy.com/>

Information management & technology. Cimtech Ltd University of Hertfordshire, College Lane, Hatfield, Hertfordshire AL10 9AB. <http://www.cimtech.co.uk/>

Web sites that contain useful information on all aspects of EDRM include the following plus individual supplier web sites:

- <http://www.aiim.org>
- <http://www.cimtech.co.uk>
- <http://www.document-manager.com>

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