

The benefits of Electronic Records Management Systems: a general review of published and some unpublished cases

Gary P. Johnston and David V. Bowen, Audata Ltd.

Introduction

This paper is a review of the benefits claimed by, or achieved by, organisations which have implemented an electronic records management system (ERMS), an electronic document management system (EDMS), or an electronic document and records management system (EDRMS). Since one finding is that users benefit most from a continuum model covering both documents and records, the term EDRMS will be used henceforth in this paper. The review has sought practical examples that illustrate the success, or otherwise, of implementing an EDRMS. The discussion is divided into two streams: do EDRMS work in terms of their technical functionalities and do they provide an acceptable return on investment. In each case, a critical question is whether the EDRMS works in human terms.

This review also discusses whether an EDRMS is able to manage the types of records that exist now, not just text based documents, but active objects such as spreadsheets, and multi dimensional objects such as websites and databases.

What is an EDRMS? Definitions of ERMS and EDMS

Before it is possible to discuss whether EDRMS provide benefits, it is necessary to define what an EDRMS is. There is a degree of confusion over this. This confusion includes the difference, and the importance of the difference, between ERMS and EDMS.

An electronic records management system, ERMS, as the term stands, could be an electronic system for managing records on any media. An electronic system for managing paper records in a records centre or registry would be an ERMS. An ERMS could also be a system for managing electronic records, that is computerised records. Evidently some standardisation of meaning is required before benefits can be identified and measured.

According to the National Archives of Australia, an EDMS is

“An automated system used to support the creation, use and maintenance of electronically created documents for the purposes of improving an organisation’s workflow. These systems do not necessarily incorporate recordkeeping functionality and the documents may be of informational rather than evidential value (i.e. the documents may not be records).” (National Archives of Australia, 2005)

By contrast, the NAA define an ERMS as

“An automated system used to manage the creation, use, maintenance and disposal of electronically created records for the purposes of providing evidence of business activities. These systems maintain appropriate contextual information (metadata) and links between records to support their value as evidence.” (National Archives of Australia, 2005)

These definitions pose new questions. Do they reflect reality? More important, are they relevant to the end user?

The NAA definitions indicate that an ERMS is NOT an electronic system to manage physical records. However, many ERMS, for instance TRIM® (from TOWER Software) and Wisdom® (from Diagonal Solutions), do contain the functionality to manage paper files. Indeed TRIM (an Australian product), is one of many ERMS which can trace their origins to the management of paper records in registries and file rooms. Also, an important lesson for modern organisations is that paper and electronic records must be managed to the same standards and policies. This reduces legal risks and improves operational functions.

It is also interesting to note that NAA regard an EDMS as a tool for improving the efficiency of an organisation’s business processes, but they do not regard an ERMS in the same way. Interesting because records are produced as a result of an activity taking place, circumstances in which workflow and the resultant efficiency gains are useful. The two definitions require a clear separation between “documents” and “records”. This does not reflect the way many organisations work today, in both government and the private sector.

There is an implied need within these two definitions that at some point a document must be ‘declared’ as a record. The implication is that documents are managed using the workflow, and then some of them are declared as records outside that workflow. This approach is used in many COTS EDRMS and is a weakness discussed later in this paper.

Of course, many of the systems on the market are both an EDMS and an ERMS, hence the term used in this paper, “EDRMS”.

Is an EDRMS an Information System?

Another approach to defining an EDRMS is to ask what makes an EDRMS different from other information systems. After all an EDRMS is a system that captures and manages information.

Webopedia defines an information system as

“a system that collects and stores data”. (Webopedia, 2003.)

The Stanford Electronic Health Information Security Committee defines an information system as

“ an interconnected set of information resources under the same direct management control that shares common functionality. A system normally includes hardware, software, information, data, applications, communications, and people.” (Stanford, 2003)

Terry Cook (Cook, 1997) describes the differences between information systems and records management systems by saying that

"information systems (which is what we have) contain data that are timely; efficient from a technical perspective ... manipulable; and non-redundant -- old data are bad data, and are therefore replaced by new, updated, correct data. Record-keeping systems (which is what we need, and largely do not have) are just the opposite: they contain records that are time-bound and context stamped; inefficient technically ... inviolable and unchangeable once created; and redundant -- old data are not condemned as outdated and therefore deleted, but are viewed as being just as valuable as new data."

According to Horsman there is a distinction between a records management system and a records keeping system. He argues that records management is what records managers do, whilst records keeping is what organisations and indeed society in general does. Horsman defines a record keeping system as

“the whole of records, methods, procedures, tools, [meta]data, knowledge, means and persons with which an organisation fulfils its requirements to preserve evidence of its activities, maintain its memory, and preserve its knowledge.” (Horsman, 1999)

This is a useful definition in that it emphasises the point that a records keeping system is about more than just the software: it is about a complete system that involves people carrying out their jobs. It is also interesting to note that the definition of an ERMS provided by NAA does not include any mention of human interaction.

In this paper an EDRMS is defined as “

“An automated system which supports the creation, use and maintenance of paper or electronic documents and records for the purposes of an organisation’s workflow and processes. An EDRMS includes recordkeeping functionality and also manages documents of informational rather than evidential value. The EDRMS includes the whole of documents, records, methods, procedures, tools, [meta]data (index terms), knowledge, means and persons with which an organisation operates and fulfils its requirements to preserve evidence of its activities, maintain its memory, and preserve its knowledge.”

What are the benefits?

The benefits reported in case studies of EDRMS are varied. The present paper will focus on benefits which can be measured and which are experienced by:

- Individual users
- The organisation
- Society as a whole

McLeod (1996) in her review of a document management strategy report states that “the most important success factors for DM (document management) systems, almost irrespective of business sector, included faster task completion, improving quality and reducing costs, the least significant being meeting statutory requirements, improving document security and improving cash flow.”

The basic benefits are that a process (work) is done more easily (less effort required); it is done more quickly; it is done with better quality; it is easier to find out about it afterwards. Expanding on this, measurable benefits could be summarised as:

- Individual users
 - Information available when required
 - Greater quality, efficiency and effectiveness at work (processes are better, easier and quicker)
 - Less blame and dissention when looking for lost information
 - Evidence is available for what they were asked to do and what they did
- The organisation
 - Work is done more quickly
 - Completing a task requires less effort
 - Quality of processes and their outcomes is improved
 - Cash flow is improved
 - Compliance with laws and regulations is achieved and demonstrated
- Society as a whole
 - Organisational processes are open and can be understood and monitored
 - Organisations comply with laws and regulations
 - Quality of life is improved
 - The historical record is accessible and reliable

These three sets of benefits track the life history of documents and records, and demonstrate the requirement to manage information throughout that life history. Initial benefits accrue mainly to individuals (and smaller organisational sub-units) during the preparation of documents. Later benefits, obtained as transactions generate actual records (evidence), accrue to the organisation as a whole. Finally, society benefits in the long term.

Do EDRMS work technically?

The degree to which an EDRMS works technically can be considered from at least two perspectives. First, are they reliable; can they be backed up; can they be recovered from a backup (e.g. after a disaster)? The second perspective is around their ability to manage records regardless of their format or structure (paper, electronic, multi-media).

Independent research into the amount of uptime, or downtime, to be expected from an EDRMS has not been found. However, experience indicates that the established systems are robust and reliable with very little down time. One support team believes that average uptime is in the region of 99%, even without special measures such as hot spares and redundancy in the system design. (Audata, 2005a) Simple technical reliability, having the EDRMS on line and available when required, can be achieved relatively easily.

There are few, if any, published accounts of the recovery of an EDRMS after a disaster. In general, such a recovery would require restoring the database (in which the metadata are kept), restoring the system settings and choices (from the EDRMS software, or from a database), and restoring electronic objects (from a document store or from the database). It is probably to be expected that actual experience of disaster recovery would not be reported. However, disaster recovery tests with several different EDRMS suggest that this technical aspect of EDRMS is also met successfully. (Audata, 2005a.)

Most EDRMS are able to manage any type of record. The record could be paper, a text document, a spreadsheet, a database, a web page, a scanned image, a sound or video file or a drawing. The EDRMS stores the record as a bit stream, a series of 1s and 0s. From this point of view, any modern EDRMS can manage any type of record.

However, not all of the record types just mentioned are suitable for management with an EDRMS. The problems arise with records that could be described as multi-dimensional objects, such as databases. This was acknowledged by Fredriksson (Fredriksson, 2002). A text document is a two dimensional object; it can be represented on a piece of paper. However, a database is a multi-dimensional object; it consists of rows and columns in a series of tables, and of complex interactions in the form of relationships among those tables. The database, as it is actually used, may also include specific SQL queries and the views or reports they produce.

The records (the evidences for transactions) are produced from the database as a direct result of those relationships and queries. An example is a payroll system. A viewable record is a payslip, but the data required to create that payslip are stored in a series of tables; the data are extracted according to the relationships defined among those tables and according to the queries run. In brief, storing a database (as a collection of payroll – or other – records) within another database (the EDRMS) is probably not good practice. It may be better, as is sometimes done with SAP systems, to store the images of the actual evidences of the individual transactions in the EDRMS. The database is then used for processing, but the records are stored separately in the EDRMS. (Audata, 2005b.)

Can EDRMS records be trusted?

Once it is accepted that EDRMS will do their technical work, it is important to ask whether records in an EDRMS can be trusted. The notion of trust is an important one. Can you trust the system to ensure that the records are authentic and reliable? Virtually all EDRMS contain an audit log that will note each access to the records. Nearly all EDRMS enforce version control.

A longer discussion of security is not within the scope of this paper. The key point is that EDRMS can be trusted; each system must be set up after a risk analysis, and must be configured so that trust is maintained. Often this means that the EDRMS should be set up in such a way that no one person acting on their own can commit a fraudulent act and then cover that act up.

Do EDRMS meet the standards?

The role of standards in securing benefits from EDRMS is outside the scope of this paper. It will suffice to say that the standards, such as MoReq, ISO 15489, US DoD, or the UK TNA, can be useful frameworks for identifying possible benefits and for planning an EDRMS implementation. (McKinnon, 2004.)

Note that none of these standards are assessed performance standards. All of them are guidance for the basic systems or for generic implementations, and so they do not directly ensure benefits, or even performance. Benefits flow from a specific implementation of an EDRMS, which must include the people and processes involved in the EDRMS.

Do EDRMS Provide Benefits to People?

Some users see an EDRMS as a threat. They imagine that their work will become harder, more complex, and more regimented. They may not see any benefits to themselves from using the EDRMS. Thus, a key element in the implementation of any EDRMS is user acceptance. This includes getting people to use the system, and showing people how they and their organisation will benefit from the system. A key consideration is that the system “does not impose any changes in working practises...” (BRE/CICA, 1999) So it is often imperative that the system not require people to make

significant changes to the way in which they work. Equally important is to ensure that the system is usable by people with different levels of IT ability.

If the human elements of the project are important, then special care must be given to the delivery of training. This is likely to be the time when the first contact with many of the actual users will take place. It is an opportunity to do much more than just explaining how the software works; it is an opportunity to explain why an EDRMS is being implemented, how it will affect working practices and to allay fears generated by change, in other words it should be used as part of the change management process.

At the National Archives training “included a department briefing, and training in records management, the file plan, and (the ERMS). Each user was given a half day’s training in the required record management practice, prior to going live, followed by a half day’s PC-based instruction on the use of the tool.” (The National Archives, 2004) This is a similar approach to the one used at the Royal Parks. “At the start of every training session, time was given to explaining why an ERMS was being implemented and a discussion held on the benefits of using an ERMS.” (Hipwell 2005)

It is important to assess the IT literacy of those being trained. For example, at the Royal Parks “some of the horticulturalists are world experts in their field but have little contact with computers.” (Hipwell, 2005). Indeed the game keepers only used a computer to do one task, and nothing else, “and I don’t want to have to do anything else” was one unwritten requirement from a user. (Personal Communication 1, 2004) In the end, this implementation was successful, providing benefits to individual users as well as to the Royal Parks Agency itself. (Hipwell, 2005.)

Desk side training should be used to reinforce previous classroom based training. It provides a personal touch and allows the trainer to help with specific areas of interest to the user. Questions that might be unasked in a training room are more likely to be asked on a one to one basis.

Another tactic successfully deployed at the Royal Parks was the use of a training instance of the system. It is straightforward to create a training instance of an EDRMS. This is a separate database from the ‘live’ system, but identical in all respects. This means that people can put real records into a real system during the training. “This made training risk free, people could play about.” (Hipwell, 2005)

The DTI, with over 5000 users, has reported a 37% reduction in time searching for information, and 75% reduction in filing time. These improvements will release at least 500 full time equivalent staff to focus on their processes rather than filing or searching for information. (RMS Bulletin, 2005.)

Do EDRMS Provide Benefits to Organisations?

Aspinall (2004) has provided some general comments on return on investment and organisational benefits. The comprehensive Cimtech Guides always include a cost discussion and some case studies. (Hendley, 2001) As with most of the other case studies reviewed here, they almost never report both the full costs and the detailed quantitative benefits.

Orange County, California, report that savings from an ECM (as they call their EDRMS) were over \$1,000,000 per annum, with additional savings of office space (over 800 square meters). They also report improved satisfaction among their customers. Sadly, they do not report the cost of their project. (Winton, 2003.) It is likely to have been around \$650,000.

The Ove Arup case study (BRE/CICA, 1999) provides confident evidence of process and financial benefits from a system developed in house. Although they do not provide quantitative data, and indeed explain why these cannot be provided, they estimate that the cost of developing and supporting Columbus (the internally developed EDRMS used at Ove Arup) is £120,000 per annum (about £200 per user). The comparable cost of a commercial system was estimated as £3,000,000, with annual charges of £1,000,000. Ove Arup are confident enough in their system that they are now offering it to others.

Nucleus Research reports some return on investment figures for EDRMS projects. (Nucleus, 2004.) For example, Transport Canada reported an ROI of 86%, and a 1.17 year payback. Their project lasted over three years, and involved 5,200 users by the end. Unfortunately, most of the benefits are indirect benefits, for which no details are given.

The same problem affects other Nucleus ROI reports, such as the report of a three year EDRMS project for Aventis Pharma, with 55,000 users. (Nucleus, 2001.)

In 2000, an EDRMS was implemented for a large company based in the Southeast. This was an electronic system to manage paper records, based on Wisdom from Diagonal Solutions but with bespoke retention scheduling, location control, and enquiry management modules. Before this, an asset management system was used to catalogue the records at box level, and the boxes' locations were registered on a spreadsheet. There were no naming conventions, no standard terms for classification, no retention scheduling, and no confidence that anything could be retrieved when required. Some 30% of records were described as 'miscellaneous' or 'various'. The general picture was that when somebody left the company, their desk was emptied into a box and sent 'to archives'.

The new system included the software, a new set of policies, procedures and guidelines, and significant user training. Records are catalogued by the users themselves according to agreed and approved classifications. In parallel a team catalogued the legacy records at file level. The culture gradually changed from using the records centre as a dumping ground to using it as a

repository of information. The change was largely brought about by people being confident that they were able to find information when they needed it. (Johnston, 2005.)

Cost Models and Scanning

It is often claimed that an EDRMS will save money on storage costs. It is 'evident' that electronic storage is cheap, whilst paper storage is expensive. Audata recently reviewed this for a client (a commercial organisation of about 2000 staff over 2 main sites and 6 smaller subsidiary sites).

The client has an outsourced records management service, with 350,000 records in 60,000 boxes; each box contains on average 1,300 sheets of paper. The storage is provided at a cost of about £210,000 per annum. To scan and index this number of records/pages would cost around £2 ½ million. Add to this the storage costs to manage several terabytes of data and the financial advantage stays with paper storage.

Records storage is often a small part of any records management budget. A larger cost is retrievals, so these were also investigated. Two thirds of records (65%) were never retrieved from the records centre; a small proportion were retrieved once or twice (13%); the remainder (22%) were retrieved 3 or more times. The records retrieved three or more times are cost effective to scan.

Access and User Convenience

Paper records can only be in one place at a time. Electronic records can be viewed by many people at the same time. This has benefits in terms of access: users in different places can discuss the same record, or different users can use the same record for different purposes.

Remote access to records by staff who are not in the office has been a significant benefit to one project. Salford City Council has been able to allow staff who work within Benefits Administration to work from home. This has provided several tangible and intangible benefits. For example, there has been a 15 – 20% improvement in productivity in Council Tax and Benefits processing and an even more significant increase of 48% in productivity within Overpayments. There has also been a 75% reduction in absence due to sickness. Intangible, but important, benefits include a heightened level of staff satisfaction and motivation. (Salford, 2005.)

Another example where remote access has a positive effect on working methods is electronic social care records. The social worker or clinician does not have to be in their office to access records; a laptop with a connection to the server allows them to access records remotely. This can help field workers, case consultations, and interagency cooperation. (Johnston, 2004.)

Storage and Retention

An EDRMS provides a means for managing records in line with agreed and approved retention guidelines ensuring that a process to delete records that are due for destruction is in place. An EDRMS will also assist with the reduction of the number of copies of the same document stored, thus a two pronged attack on reducing the amount of storage required.

Records due for destruction may simply have their retention period extended because the business is risk averse and doesn't want to destroy anything. In terms of EDRMS, this remains an issue that can only be solved by the records manager and their influencing skills.

The process of declaring a document as a record to fix its form and contents, and to start the retention period, may be unfamiliar to staff. Implementing an EDRMS can be an opportunity to teach staff about the difference between documents and records, and to encourage them to make suitable declarations of records. However, it may be more efficient, and more to the benefit of the organisation (with less inconvenience to staff) to develop a process for declaring records.

Preservation

An EDRMS can aid digital preservation. The most important step (and one of the more costly steps) in preserving records is to capture them. An EDRMS can ensure that the records are captured and stored and can also provide a confidence that the records are authentic. (Testbed, 2004.)

Conclusion

EDRMS provide benefits to individual users and to organisations. The benefits have rarely been measured carefully; studies in which benefits and costs were both reported in detail would be valuable for studies of EDRMS.

The benefits are not assured; they depend on well-planned and executed implementation projects. They also depend on attention being paid to the human aspects of the EDRMS: user acceptance, user training, and on-going user support are all key to achieving real benefits.

1 References

AS4390. 1996: Records Management Standards Australia.

Aspinall, 2004. Justifying an investment in EDRMS: some thoughts on the internal sales process! Records Management Society Bulletin, February 2004. pp 13-15.

Audata Ltd. 2005a. Unpublished observations.

Audata Ltd. 2005b. Confidential observations.

BRE/CICA Case Study. 1999. Document management at Ove Arup & Partners.

http://www.cica.org.uk/arup_columbus_edm_case_study/arup_columbus_edm_case_study.htm

Cook, Terry. 1997. The impact of David Bearman on modern archival thinking: An essay of personal reflection and critique. Archives and Museum Informatics. May 1997, p15-37.

Fredriksson, Berndt. 2002. The changing role of archivists in the contemporary society. Comma, 2002 – 1/2 p37 43.

Hendley, 2001. Hendley, Tony. Document Management Guide and Directory, Cimtech. 12th edition. 2001.

Hipwell, G. and Johnston, G. 2005. Records Management for field based staff at the Royal Parks Agency. Records Management Bulletin, April 2005.

Improvement and Development Agency. <http://www.idea-knowledge.gov.uk/idk/aio/286791> (Salford City Council)

Johnston, 2004. Johnston, Gary P. Managing Electronic Social Care Records, Records Management Bulletin, April 2004. pp 23-28.

Johnston, 2005. Unpublished communication.

McCleod, J. 1996. A review of 'document management strategy report – the virtual opportunity'. Records Management Journal Vol 6, No 1, April 1996, pp62 – 64.

McKinnon, 2004. McKinnon, Cheryl. Looking Forward: the Evolution of RM in the Electronic Workplace. www.Peertopeer.org August 2004.

National Archives of Australia, 2005. <http://www.naa.gov.au/recordkeeping/er/guidelines/14-glossary.html>

National Archives, The. 2004. Briefing Notes on how The National Archives put in place an electronic records management system (ERMS).
<http://www.nationalarchives.gov.uk/about/operate/pdf/erms.pdf>

Nucleus, 2001. Research Note B24. Nucleus Research Inc.
www.NucleusResearch.com

Nucleus, 2004. Case Study E10, Nucleus Research, Inc., January 2004.
www.NucleusResearch.com

Personal Communication 1, 2004. Name and address withheld for security reasons.

RMS Bulletin, 2005. EDRM Benefits the DTI, a Case Study. Records Management Society Bulletin, June 2005. p.18.

Salford, 2005. Salford City Council, as reported at www.salford.gov.uk.

Stanford, 2003. <http://ostinato.stanford.edu/hipaa-feedback/definitions.html>,
10 March 2003.

Webopedia, 2003. <http://www.webopedia.com/TERM/s/system.html>, 19
February, 2003

Winton, 2003. Winton, Peggy, AIIIM E-Doc Magazine, July/August, 2003. p.
60.

Bibliography

Fresko, M. 2001. ERM...getting on with it. Conspectus. September 2001
p20-21.

Records Management Society of Great Britain-Local Government Group. 2004.
Local Government Classification Scheme.
<http://www.esd.org.uk/standards/lgcs/0.02/lgcs.doc>

The National Archives. Digital Archive.
<http://www.nationalarchives.gov.uk/preservation/digitalarchive/>

The National Archives. PRONOM.
<http://www.nationalarchives.gov.uk/pronom/>