



# Bringing the benefits of information technology to industrial hygiene records management

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The need to maintain adequate control over documentation is gaining increasing significance within industry and organisations. This need has been precipitated by the increasing litigation culture in society and the prolific quantity of information being created.

Organisations need to recognise the implications of these phenomena on their operations and devise procedures and strategies to maximise the efficiency of their records management.

This article presents an overview of recent initiatives undertaken by the Western Australian operations of a large mining, refining and smelting company to create a fully electronic, text-searchable records management database for all industrial hygiene-related documentation. The system creates a new benchmark for maximising the efficiency of records management and has completely revolutionised the way that records are stored, accessed and retrieved. This project's applicability and value extend to all aspects of industrial hygiene records management, as well as to other areas in organisations — including legal/litigation, environmental, human resources and workers compensation records.

## KEYWORDS

- ALUMINIUM INDUSTRY
- INDUSTRIAL HYGIENE
- INFORMATION MANAGEMENT
- LEGAL ISSUES
- RECORDS MANAGEMENT

## Introduction

One of the consequences of the information age is the prolific quantity of information that organisations produce. It has been estimated that the volume of corporate data doubles every year, and that the average Fortune 1000 worker is sending and receiving approximately 178 messages and documents each day.<sup>1,2</sup> In addition to the voluminous amount of paper records held in company archives and live files, electronic documents must also be included in a company's approach to records and information management. The only way to effectively manage and control documents is to use information technology (IT) systems as tools to create, store, access, use and share documentation.

Concurrently, our information and knowledge-driven economy has increased the expectation on individuals and companies to have access to information. Companies need to ensure that their information is where they want it, is available when they want it, is in the condition they need it to be in, and is available exclusively to those that they want to have access to it — but only to them.<sup>3</sup> Additionally, the growing litigation culture in society precipitates the need to maintain adequate control over documentation and to be able to quickly and efficiently produce a full and complete documentation history.

## Industrial hygiene records management

This article presents an overview of recent initiatives undertaken by a large mining, refining and smelting company to create a fully electronic, text-searchable records management database for all industrial hygiene-related documentation. The company, recognising the importance of records management, has various procedures in place that determine the way documents are stored and retrieved. It employs a document management consultant to ensure that

the company's records management procedures are fully adhered to.

There are six full-time equivalent (FTE) industrial hygienists at the company's Western Australian operations. A search of the company's file archive revealed in excess of 2,500 live and archived files that relate to this area. Industrial hygiene (IH) documentation, by the very nature of the issues that it deals with, is variable, complex and often sensitive in nature.\*

## Complications

With a recognition of the potential for IH documentation to be needed in litigation, for research and in responding to stakeholder enquiry, the company examined its management of IH records and identified that it could improve the efficiency of its records management. The company has since embarked on an exercise to improve the management of its IH-related documentation. There were a number of issues and challenges that needed to be recognised and addressed to ensure that an adequate solution was devised. These included the following:

### Information overload

Advances in information and communications technology have resulted in a prolific quantity of information that companies produce and receive from external bodies. At the same time, there is an expectation on individuals to have clear, concise and comprehensive documentation “at their fingertips” and to be fully aware of its content.

### Records management policy

*The Australian Record Retention Manual* states that health, safety and environmental records are to be kept for 7–50 years, depending on the exact nature of the record.<sup>4</sup> The classification of the record thus becomes paramount and it raises the issue of how to classify an IH record as potentially being relevant to a legal issue and whose responsibility this is.

\* Industrial/occupational hygiene is the science dealing with the identification, measurement and control of physical, chemical and biological agents in the work environment, such as chemicals, radiation, noise, etc.

## What constitutes a “record”?

Industrial hygiene documentation is created, stored, used and shared by members of the company’s IH departments. The collection of documentation also includes the documents that are produced by other departments and those that are produced by external bodies and which hold some relevance to the IH division. Records can be in soft-copy (electronic) or hard-copy form. There are numerous types of records, including:

- policy statements, reports, catalogues, minutes, notes, procedures and instructions, training packages, exposure monitoring results, engineering records, supply records, personal protective equipment records, legal records, articles from the scientific and popular press, internal and external standards, and guidance material; and
- non-written records, for example, product samples, slides and photographs.

It is essential that all of these types of records are included in a records management system.

## Dispersed location of records

The company’s WA operations include two bauxite mines, three refinery sites and a head office in Booragoon. The company directly employs about 4,000 people, including six hygienists and others whose work is directly or indirectly related to IH. Hygiene records are thus dispersed throughout various offices at these sites, as well as those held in off-site archives.

## Protecting information integrity

Despite procedures and individual efforts to ensure that records are kept safe and secure, there is a potential for records to be accidentally misplaced or damaged over time. A solution which maximises the security and integrity of records is necessary.

## Reliance on paper-based archive systems

Many companies rely on paper-based archive systems and procedures. These systems offer limited security, and retrievability of records in a timely manner can prove difficult (even with a good indexing system). They often offer no solution to problems of record duplication, to identifying gaps in the documentation history, and to ensuring the completeness and accuracy of the archived collection.

There are a number of additional complications when dealing with records that may be needed for discovery in a legal context. These include:

- **Sensitivity of the issue:** as Australia has recently witnessed, litigation in relation to personal and environmental exposures often attracts widespread media and community attention. This attention can enhance the sensitivity of an issue and companies need to be prepared to effectively respond to individuals, employees, the community and the media.

- **Latency period:** this is particularly prevalent for conditions such as mesothelioma, where the onset of symptoms and diagnosis of the disease can be 30–45 years after the initial exposure.

- **Short prognosis:** litigants may have a limited amount of time in which to pursue their case due to the poor prognosis of their condition.

- **Direction by the courts:** in response to the poor prognosis of some litigants, the court can direct that companies must respond to discovery requests within weeks.

- **Litigation culture:** the escalating litigation culture in society means that companies will increasingly be required to enter into litigation where past practices and knowledge are being called into account.

- **Knowledge and the ageing workforce:** knowledge can be defined as a “fluid mix of framed experience, values, contextual information and expert insight that provides a framework for

evaluating and incorporating new experiences and information”.<sup>5</sup> In organisations, knowledge is essentially held by the people employed by them. As the workforce ages and employees near retirement, organisations face an inevitable loss of knowledge. This highlights the importance of identifying gaps in the knowledge provided by historical documentation and of the need to record the tacit knowledge held by key employees.

These issues pose significant challenges for the organisation and must be taken into account when deciding on the best method to enhance the management of health and safety documentation.

## Method

The company employed a project officer to examine the way that it dealt with IH records and to implement an IT solution for improved records management. The project officer worked closely with the company’s Occupational Hygiene Manager and General Counsel, and input was sought from their records management and information system professionals. The aim of the project was to create a complete electronic archive of all documentation relating to IH issues.

As a driving force behind this project was the potential for IH records to be needed in litigation, a logical starting point was to examine the way that the company’s external law firm dealt with documents provided to it during discovery. Input was sought from the firm’s IT Manager who demonstrated the IT system in use and provided information on other legal IT systems on the market. Subsequently, a records management software product was chosen and implemented (following consultation with vendors).

## About the records management software

The software used for this project is primarily a computerised litigation support tool. However, it has functionality and application that extends far beyond what is required for litigation purposes.

After reviewing its features and abilities, the company decided to use it as a records management tool to store, retrieve and manipulate electronic documents. It can be used for transcript and document management, to link documents together, to view full images of documents, to mark up documents, as a brainstorming platform, and to collaborate and share documents with others. Most importantly, the optical character recognition (OCR) feature ensures that all documents can be easily and quickly searched in full, and viewed on the user’s computer. In addition to scanned hard-copy documents, the software is able to capture and search all soft-copy documents that are stored on the company’s network — ensuring that the electronic archive is comprehensive and up to date. The software is interoperable with other legal IT products and, as the documents are stored as portable document format (PDF) files, they can be opened using Acrobat Reader. The minimum system specifications for the software are Windows 98 (or better), 128 MB RAM, and a 300 MHz (or greater) processor.

## Piloting the software

It was appropriate to begin with a pilot implementation of the software, before rolling it out to all IH documentation within the company’s WA operations. The pilot project focused on a hard-copy archive of IH-related documentation that was held in a central location. The archive contained over 5,000 hard-copy documents covering a period of 40 years or more and the records were deemed to be subject to the influences mentioned earlier. Implementing the pilot involved two stages: (1) software purchase, testing and deployment; and (2) scanning the hard-copy documents.

The software was purchased from the Australian distributor, which also provided training on the product to the project officer. The mining company’s information system professionals performed compatibility testing and concluded that the software was compatible with its standard operating platform and that it was consistent with its

strict security requirements. It was determined that there was sufficient server space to store the images and data (as a guide, 1 GB is needed to store approximately 13,000 images and the associated data). This period of testing and review ensured that no problems were encountered when installing and using the program on the network.

Over a series of weeks, all documents held in the hard-copy archive were individually bar-coded. The OCR scanning and data entry were outsourced. Documents were returned to the company, accompanied by a CD-ROM which contained all document images as well as the data entry on each document (author, date, document type, etc). This information was loaded into the software and stored on the company's network.

## Outcomes

The pilot was deemed a success. As a result, all 5,227 hard-copy documents (more than 25,000 pages) from the pilot archive are now available electronically, in a fully text-searchable database. Within days of its completion, an issue arose which required a comprehensive search of the database. The keyword search of the archive took only minutes — as opposed to the days it would have taken to find a portion of those documents via a manual search of the hard-copy archive. The documents were able to be quickly electronically retrieved, processed and shared. The pilot was therefore deemed to have immense value, from both a legal and a research perspective.

The numerous advantages of the electronic archive include:

- **Easy to use:** the software uses a Windows-based platform that is easy to learn and use.
- **Long-term security of records:** all hard-copy documents are now available in an electronic full-text form that will be kept indefinitely. The security features of the software ensure that documents are only available to authorised users. As the documents sit on the company's network, they are backed up automatically on a daily basis.
- **Centralised database:** all records are now kept in a centralised electronic location. The software maximises the security and integrity of the records, as it eliminates the problem of accidental misplacement or damage of the documents. The company can now be confident that it has a complete, comprehensive historical record of its IH-related documentation.
- **Economical:** the costs of purchasing the software, associated licences and document scanning were minimal when compared with the direct and indirect costs associated with misplaced documents and manual searching of hard-copy files.
- **Comprehensive and accurate searching:** due to the OCR/full-text searching capability, the solution lends itself to more comprehensive and accurate searching of the records. One can search by author, keyword, date, document type, etc. For example, a search on the word "vibration" would produce a subset of all documents in the archive that have the word "vibration" in the title, subject or anywhere on the page. Although OCR of the scanned images is not perfect, the errors made were deemed insignificant compared with the time that it would have taken to manually search through paper records.
- **Efficiency:** the timeliness of searching and retrieving documents is substantially enhanced.
- **An e-document solution:** the software allows all newly created electronic documents (including emails) to be added to the archive with a click of the mouse.
- **Mobility/flexibility:** the electronic archive can be accessed via the company's network or via a secure link via the Internet. This is especially useful for lawyers, researchers and others who are not based on site or who work remotely.
- **Litigation advantages:** with improved accuracy and comprehensiveness of records, the company can more appropriately allocate financial accountability to various insurers.
- **Wide applicability:** the software is widely applicable to records management in various

departments in the company, including IH, litigation, human resources, environmental and workers compensation records.

— **Range of uses:** there are a number of areas where the software is useful, including litigation, document management, documentation control, and research.

## Discussion

Due to the success of the pilot project, the company is planning full implementation of the software to all IH-related documents at its WA operations. This will involve the scanning and electronic storage of records from over 2,500 live and archived files (potentially containing more than one million pieces of paper). The software will continue to be used to capture newly created electronic documentation produced by IH and stored on the company's network. This will ensure that the electronic archive is consistently maintained and up to date.

One identified use of the electronic archive is as a research tool. Once full implementation is complete, the company will be able to: easily put together summaries of the documentation that it has in relation to certain IH issues; identify gaps in the historical documentation; and compile time lines and summaries of the issues over time. The company also plans to populate the archive with transcripts of interviews with key employees in an effort to record some of the tacit knowledge that is held by these individuals. This information will be used as a resource for current and future industrial hygienists; it will also provide an imperative resource for any future litigation where IH practices and knowledge are being called to account.

Interest in this initiative has been expressed by various company departments within its WA operations, as well as the company's interstate and international locations. The work has demonstrated that significant advantages can be gained by adopting an electronic solution to records and information management. The project's applicability and value extend to all aspects of IH records management, as well as to other divisions within the company.

## Conclusion

The company has purchased and implemented an IT solution to improve the efficiency of its management of IH-related documentation. The system creates a new benchmark for maximising the efficiency of records management and has completely revolutionised the way that records are stored, accessed and retrieved. Searching for documents and information now takes seconds — compared with it previously taking days.

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