



# SPECIFICATION



## e-Archiving System (eAS), Methodology and Process

The introduction of email, internet and electronic document has caused new challenges for corporates to retain and preserve evidence. Recent events involving Eron and Worldcom throws new doubt about corporates ability to maintain and ensure corporate transparency.

The flood of paper and digital documents in global organizations can drown the best information infrastructures. Gaining control is only the beginning, as the next step is the difficult task of retaining them in accordance to corporate guidelines, regulatory requirements.

Legacy record management schemes focused on the control and movement of paper – documents within file folders within binders within boxes. But how are the volumes of information electronically generated – from office suite applications to email and fax systems to forms, PDF, and web site content – added to records practices? How can all users across an enterprise have instant and appropriate access to records without a singular custodian acting as the gatekeeper? And how does the gatekeeper gain more time to vigilantly guard corporate assets while spending less time processing access requests?

In today's corporate, electronic mail and electronic documents forms the lion share of written communication and records. While the volumous data is a new challenge in managing corporate record, it also provides new opportunities as electronic documents are much eailier to transport and locate compared to their paper counter part.

Global corporates replies on their remote office to maintain records in accordance to policy and statutory requirements. As with recent cases involving corporates like Eron, records and evidence were destroyed that compromises the organisation's governance.

Our invention is a method and process to ensure corporate records and documents are properly maintained, persevered and transferred for long term retention, centrally. Its users will include global corporates, Governments and any organisations that needs to preserve electronic documents.

Our invention, **eAS**, is a method to create an organized, secure environment to manage the complete lifecycle of all electronic corporate records – from creation to ultimate disposition. **eAS** administrators rely on extensive security features that defend against unauthorized access and alteration to documents. With electronic documents protected appropriately for use and retention, their caretakers can then focus on strategic custodial functions.

**eAS** consists of a set of holistic approach methodology and process solution for organizations to archive and retain large volume of electronic documents in a repository management or other generic filling systems. **eAS** is based on XML<sup>1</sup> (Extensible Markup Language), an industry standard format for data storage and exchange.

The use of cryptography and XML technologies are key to the process of transfer, accounting for the integrity and authenticity of electronic transferred documents. Document properties and metadata described the document and any information that relates to them are also preserved and transferred. This information includes document profile, system parameters, author, date and time of creation, history log, security setting, application type, etc.

Long term availability of the electronic documents is paramount where electronic documents are likely to be kept for many decades. For this reason, the choice of storage media can be regular magnetic drives, CD-R, DVD-RAM, Microfilm etc., or either directly attached to a Storage Area Network (SAN). As mass storage technologies change, **eAS** is designed to allow easy migration of all archive documents from one media to another.

The **eAS** method consists of four processes that are interlink and interface with a repository management or other generic filling systems. There are:

- ❖ Archival Appraisal Policy
- ❖ Archival Transfer
- ❖ Archival Reference
- ❖ Archival Preservation

The details methodology and processes will now be described with references to the accompanying drawings in which:

Specification Figure 1, shows the methods and processes for Archival Appraisal Policy, Archival Transfer and Archival Preservation. While Specification Figure 2, shows the method and process for the Archival Reference.

---

<sup>1</sup> Developed by the WWW committee, XML provides a standard language format to described data, so as to facilitate document exchange. This standard format allows authorized users to retrieve and display specific data files at a point in the future, without relying on the original vendor's software, operating system or hardware.

As shown in **Specification Figure 1**, the input source into a repository management or other generic filing systems consists of electronic documents generated from various types of office suites applications. The repository management or generic filing systems, engines delivers a full spectrum of typical functions for a document management life-cycle. This includes document profile or metadata, file reference folder, comprehensive search engine, version control and audit trail, security or authorization setting and etc.

### **Process A – Archival Appraisal Policy**

In a repository management system, the creator of file reference folder determine the initial archival policy. This is based on the principle that the creator of the file reference folder understands the purpose of the file reference folder and thus will be able to determine its document life-cycle in term of *Retention Period* and *Disposal Action* properties. Individual document that are files into the file reference folder will inherit its life-cycle and archival policy.

The Archival Appraisal Policy process allow authorised administrative record officer to incorporate corporate archival policy on file reference folder. This process will then validate and update automatically (if necessary) on relevant file reference folder on the *Retention Period* and *Disposal Action* properties that the initial creator has set. This gives a high degree of assurance that archival file reference folder has been appraised according to corporate archival policy. An XML file on the appraisal on the file reference folder will be generated to be used either for reporting or results extraction can be returned to user.

Once validated and appraised, the process will generate an *Authority Number* and *Review Date* and update the file reference folder properties and enforced the archival policy. The creator will not be able to alter the *Retention Period* and *Disposal Action* properties.

### **Process B – Archival Transfer**

Once the Archival Appraisal Policy (Process A) has been appraised and enforced on the file reference folder at the repository management system, the transfer of archives documents to an external storage media is handled by Archival Transfer process.

The Archival Transfer process will select the file reference folder and extract those electronic documents exceeding the *Retention Period* properties and conformed to the Archival Appraisal Policy. Only electronic documents assigned with an *Authority Number* and *Review Date* properties will be archived.

Once confirmed archived, the Archival Transfer process will extract and converts electronic documents to either PDF (Portable Document Format) or TIFF ( Tagged-Image File Format) as archival document format. The format of archived document will be divided into 3 major sections.

There are:

a. Electronic document description or metadata

This section describes the document. It is again divided into 3 parts. The first part contains information regarding profile of the document, such as author, document name, key word, file reference folder etc. The second part contains information regarding system parameters, such as document size, access control list, document number, etc. The third part describes the history of the document, such as number of versions created, access log including user name and actions taken.

b. Native document

This section contains the original document in its native format of its creating authoring tool. In the event that the document is encrypted or digitally signed, this section will carry the same signature and encryption as that in the repository management system.

c. TIFF or PDF document, or document in electronic print form.

TIFF is the most widely used open imaging standard today. Almost all imaging products support TIFF format. More importantly, it is not proprietary to any commercial organization. This section contains the printed image of the document in TIFF format. As TIFF is widely used from imaging to fax technology, we expect TIFF to continue be supported by most software in the market for many years to come. As TIFF is an image, like paper, it is unable to represents rich format like multimedia and animation. Despite its limitation, providing TIFF image of the document in the archive document offers a “back up” method in the event the original format is no longer viewable. The extracted TIFF image can also be directly output to microfilm with devices such as Kodak’s Microfilm Digital Archive Writer system to produce microfilm for physical archival. Alternatively, the Acrobat Portable Document Format or PDF, can also be adopted as an equivalent of TIFF image format.

The whole archive document, containing the three sections, conforms to XML (Extended Mark-up Language) standard. XML is currently widely accepted as the standard format for document exchange. To preserve integrity and security, the authorised administrative record officer has no access to the secured documents as all conversion are performed at the server side automatically. At no time is the document open for manipulation at the client computer.

The archived XML file will be encrypted with an appointed Public Key Encryption and digitally signed. Archived documents can then either be output or manually copied into media like regular magnetic drives, CD-R, DVD-RAM, Microfilm or a Storage Area Network (SAN) or other removable data storage media. Included with the exported XML files is a archival certificate or packing list that describe all the files designated for archival.

**Process C – Archival Preservation**

The Archival Preservation process allow an authorised administrative record officer to extract electronic documents that has been archived and output the imaged of the archived documents into microfilm for long term preservation.

Upon extraction process, the Archival Preservation will decrypt the archived XML file with an appointed Private Key. The extraction of PDF or TIFF file and native electronic document will be deposited into a temporary source directory with proper naming convention. TIFF conversion will be initiated if PDF file format is deposited and upon conversion, PDF files will be deleted from the temporary source directory. Embedded in the header of the TIFF images of the files are the profile or metadata of the documents, which will be captured during microfilming.

Converted TIFF files will be grouped and assigned to their respective microfilm roll number. Upon assigning the microfilm roll number, TIFF files are ready to be written or “digitally” burns to microfilm through DAW (Document Archive Writer). Once completed, the microfilm will be the exact representation of the files complete with its profile information.

**Process D – Archival Reference**

As shown in **Specification Figure 2**, the Archival Reference process allows an authorised administrative record officer to extract electronic documents that have been archived and import them back into a repository management or other generic filling systems as new document.

The record officer has to determined the location for extraction and identify the archival documents to be imported. The process involves conversion of each XML (Extensible Markup Language) file into its original native format, accompanied with its relevant properties and metadata. The use of digital signature and encryption is key to ensure the integrity and authenticity of imported documents into the respository management or other generic filling system.

**Prepared by:**

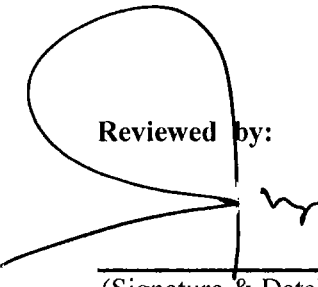
  
\_\_\_\_\_  
(Signature & Date)

**Name: Steven Yong LW**

**Designation:**

**Corporate Development**

**Reviewed by:**

  
\_\_\_\_\_  
(Signature & Date)

**Name: Stephen Lim Beng Lin**

**Designation:**

**Inventor**

**CEO/Managing Director**

