Recordkeeping for Good Governance Toolkit

PARBICA
Pacific Regional Branch International Council on Archives

Recordkeeping for Good Governance Toolkit

Guideline 14: Digital Recordkeeping – Choosing the Best Strategy

CONTENTS

OVERVIEW OF DIGITAL RECORDKEEPING STRATEGIES

This guidance has been developed to help IT managers, records managers and organisational decision-makers choose the best strategy for managing the digital records of their organisation. The guideline describes seven different options for managing digital records:

1. printing digital records for filing in a paper filing system;

2. using shared folders and network drives;

3. using software applications that allow users to collaborate in the workplace;

4. scanning paper records into a image, document, content or records management system;

5. developing hybrid (mixed paper and digital) systems;

6. implementing a dedicated Electronic Document and Records Management System (EDRMS); and

7. incorporating recordkeeping functionality into case management systems or other business systems.

The advantages and disadvantages of using each different option are explored to help your organisation decide which strategy is most suited to its current recordkeeping environment and state of digital recordkeeping readiness. When considering different options for your organisation you should conduct a risk analysis of the different strategies being assessed. It is strongly recommended that organisations using this guideline first complete the Digital Recordkeeping Readiness Self-assessment Checklist, which is Guideline 13 of this Toolkit. Your organization should also consult Guideline 19 of the Toolkit, which provides information and advice on implementing a digital records strategy.

It is important to remember that all recordkeeping solutions are temporary. The organisational environments and the IT, business and legislative environments we operate in are changing all the time. All records management strategies and systems should be reviewed and re-evaluated every five years or so. However, while systems might only be used for five to 10 years, usually the records captured into those systems will need to be kept for longer periods of time. Your organisation needs to be certain that the records will be able to outlive the system that they are first captured into.

The decisions your organisation makes today about digital recordkeeping strategies and policies will have a major impact on its future operational efficiencies, accountability, and capacity to preserve records for as long as they are needed.

1. PRINTING RECORDS FOR CAPTURE INTO A PAPER FILING SYSTEM

Printing records for capture into a paper filing system may be an appropriate strategy for organisations that have *a low state of digital recordkeeping readiness*, as assessed using Guideline 13.

Organisations that are uncertain about their ability to manage records in digital form are often best able to meet their recordkeeping responsibilities by maintaining their paper-based filing systems and printing out digital records for capture into those systems. This strategy provides a consistent and stable approach to preserving, managing, and enabling access to records.

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1. Paper systems

Advantages:
- Paper systems are usually easy for users to understand and follow, especially when they have been used consistently over time. This gives an organisation confidence that vital records will be able to be preserved and accessed when they are needed.
- It is simpler to preserve paper records than digital record.
- As organisations create and receive a mixture of born-digital and paper records (for example emails and paper letters), keeping official records in only one format reduces confusion and avoids the problems associated with having different systems for different formats.
- Paper records may be more acceptable as evidence in courts and for other legal purposes.

Disadvantages:
- Paper records often require substantial space for storage, which may be costly or which might not be available.
- Printing digital records to paper involves double handling of records.
- Staff might forget to print and file important records.
- Paper records may not be as accessible to staff or as useful for business purposes as digital records.
- Paper may not always be available when needed.
- Print-to-paper systems can fail over time, as they create extra work for busy staff. Staff members may prefer to keep (and delete) copies of important born-digital corporate records in their personal digital folders, email in-boxes and personal drives. When this happens organisations lose control over their vital records and their corporate memory, and will not be able to account for their decisions and activities.

Who might use this system?
- Organisations with low levels of technical infrastructure and training.
- Organisations that have used various different technologies that may not be compatible may find a paper system is more consistent and provides more reliable storage and access.

Summary:
At the present time printing records for capture into a paper filing system may be the only viable short to medium-term strategy for many organisations in the Pacific Islands, especially when organisations have an established paper registry file system. Like all systems, however, it only offers a temporary solution, and will need to be revisited after five years or so.

In the longer term, if your organisation relies on computers to do its work and to deliver its services, it will need to adopt a digital recordkeeping system – as the disconnect between digital work processes and paper-based recordkeeping processes may lead to breakdowns in organisational recordkeeping.

2. USING SHARED FOLDERS

Using shared folders on network drives may be an appropriate strategy for organisations that have a low or medium state of digital recordkeeping readiness, as assessed using Guideline 13.

Shared folders (also called shared drives or network drives) are often used to store, share, and provide access to digital records and files such as Word documents and Excel spreadsheets.

While they don't have the recordkeeping functionality of an EDRMS (electronic document and records management system), shared folders that are managed properly can help your organisation to store, locate, retrieve and manage its digital information assets. Tips for improving use of shared folders are available in Appendix A, on page 18 of this guide.

By improving how shared folders are managed, your organisation can raise awareness of recordkeeping responsibilities, help users engage more with recordkeeping, and eventually prepare staff for using an EDRMS in the future.

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2. Shared folders

Advantages:
- Inexpensive – uses existing infrastructure to manage digital records rather than requiring new technology.
- Easy to use, especially if staff are already familiar with them.
- Using an organised filing structure within shared folders provides a clear and understandable location for records.

Disadvantages:
- The lack of recordkeeping functionality means records can be amended or deleted.
- Shared folders are often quite informal, and the name of the folder may not always clearly indicate what is stored inside. This can lead to problems finding and retrieving information.
- Shared folders often end up being everyone's – and no-one's – responsibility. Suitably trained staff need to be given responsibility for keeping folders in good order so that they are able to be used.
- Quality control over the use of the shared folders has to be given high priority, with staff performing quality control duties given the necessary powers and training.
- Records kept in shared folders may lack context, due to limitations on the type of metadata[1] that can be applied to records.

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[1] Data describing the context, content and structure of records which enables their discovery, use, management and preservation through time.

- Metadata is less secure – for instance, any problems with the computer's operating system can change such things as a date or time associated with the creation of a document.
- Lack of adequate audit trails if records are moved, altered or deleted.

Who might use this system?
Organisations that make extensive use of computerised systems, have a well established internal computer network and want to manage and maintain their digital records in digital form, but which are only at a low to medium state of digital recordkeeping readiness.

Summary:
Managed well, shared folders may be a simple and inexpensive way to store and access information while an organisation prepares to undertake a transition to more reliable and sustainable approaches to digital recordkeeping. Managed poorly, they can be chaotic and make locating and retrieving information difficult.

In the longer term, shared drives are not usually a reliable strategy for guaranteeing corporate memory, vital information assets and essential evidence of an organisation's decisions and activities.

3. USING WORKPLACE COLLABORATION SOFTWARE

Collaboration software may be an appropriate strategy for organisations that have a medium or high state of digital recordkeeping readiness, as assessed using Guideline 13.

Software products such as Microsoft Sharepoint and IBM's Lotus Notes provide an environment in which staff can communicate, collaborate, and share and manage documents and records.

Known as 'out-of-the-box' or 'off-the-shelf' software products due to their ready-made nature, these applications need to be configured, but are generally easy to deploy if an organisation has an existing IT infrastructure. Products such as Sharepoint may be integrated with a wide variety of other software products, including EDRMS tools, to improve management of documents and records and allow additional functionality.

Some of these products have significant records management functionality or can be integrated with 'plug-in' applications that deliver this functionality. For example, RecordPoint, a records management software application that may be integrated with Microsoft SharePoint, claims to include:

- a secure document repository which prevents unauthorised changes to data;

- metadata compliance with the international records management standard, ISO 15489;

- controlled access to procedure and policy documents with automated version control;

- the ability to implement a records disposal authority that identifies information that is legally permissible to destroy; and

- a 'Destruction Wizard' that automates the disposal of records according to legislative requirements.

Even when collaboration software lacks good recordkeeping functionality, it may be possible to put in place filing structures, management rules and other corporate control mechanisms that can deliver good recordkeeping results. In such cases the approach may include the use of similar tips to those outlined in Appendix A for managing shared folders.

3. Collaboration software

Advantages:
- Allows flexible integration with various software tools.
- Digital recordkeeping can be an organic part of the organisation's digitally-enabled work processes.
- Can be a pathway for a transition to an EDRMS system.

Disadvantages:
- Ensuring that such systems deliver good recordkeeping functionality may require extensive and sophisticated configuration management and user training.
- May be more complex to manage due to the differing requirements for paper and digital records.
- May require users to make difficult choices regarding records and metadata capture.
- Can become chaotic if not properly configured for good recordkeeping or if corporate controls and user training is inadequate.

Who might use this system?
Organisations with sound IT network infrastructure that are interested in deploying collaboration software to make their business more efficient, but which may not be ready or may not have the budget to adopt dedicated digital records management systems.

Summary:
It is becoming increasingly common for organisations to use collaboration software products for digital recordkeeping. When properly implemented they have the advantage of enabling both workplace collaboration and good information and records management.

Collaboration software does, however, require careful analysis and planning before implementation starts, to ensure that the software is properly configured in association with appropriate business rules and processes to deliver good recordkeeping outcomes. For a collaboration software strategy to succeed it is important to give high priority to user training, centralised control and quality assurance, and ongoing monitoring and auditing of the recordkeeping effectiveness of the system.

4. SCANNING/DIGITISING PAPER RECORDS

Scanning paper records may be an appropriate strategy for organisations that have a medium or high state of digital recordkeeping readiness, as assessed using Guideline 13.

Increasingly, organisations are choosing to scan older sets of paper records into digital form. Often this is done to improve access to those records for staff of an organisation, although it has an additional benefit of providing 'preservation copies' of original records as a safeguard in case the original records are lost or damaged. In some cases scanning projects are initiated primarily to reduce the organisation's requirements for physical storage space for paper records. In these cases the original paper records are disposed of once the scanning project has been completed. If your organisation is planning to dispose of its original paper records after scanning it is important to make sure that the digital copies are adequate substitutes for the paper originals, and it is recommended that organisations seek the advice of their national archives before disposing of original paper records that have been scanned. There may be legal or historical reasons that prevent the disposal of original paper records that have been scanned.

Often, projects to scan older paper records begin while new or 'current' organisational records are still being created and managed in paper form. This approach creates a hybrid recordkeeping environment in which older records are available in digital form (having been scanned), while current records are available in paper form.

This approach can have the advantage of getting an organisation's staff used to the idea of using digital records, and can provide a pathway towards developing full digital recordkeeping systems for both older and current records. In such cases organisations realise the waste involved in printing born-digital records to paper for filing purposes and then subsequently scanning those paper records and creating reborn-digital records (see Guideline 12 for explanations of born and reborn-digital). Ultimately, it is more efficient for born-digital records to be managed in digital form from the moment of their creation. However, implementing reliable systems to support this scenario is a challenge for most organisations, so projects to scan older paper records can often be a good step towards full digital recordkeeping.

Even when organisations have born-digital recordkeeping systems in place (see following options 6 and 7), they will still receive or create paper records that they may want to scan into digital form so that those records can be managed in their digital recordkeeping systems.

If your organisation is considering scanning paper records, refer to Guideline 15 of this Toolkit for more detailed advice on scanning and digital reformatting.

4. Scanning paper records

Advantages:
- Provides easier staff access to records.
- Provides preservation copies of original paper records in case of disaster or loss.
- May reduce an organisation's need to maintain paper storage facilities.
- Can be a pathway to a comprehensive digital recordkeeping strategy.

Disadvantages:
- May result in confusing parallel paper and digital records systems.
- Metadata creation and management for the scanned copies may be costly and time consuming.
- Scanned copies may not be adequate substitutes for the paper originals.
- There may be double handling due to born-digital records being printed to paper, then later scanned into digital form

Who might use this system?
- Organisations with some reasonable IT infrastructure that want to make their older paper records more accessible to staff and to familiarise staff with using digital records.
- Organisations that wish to reduce use of costly paper storage facilities.

Summary:
Scanning older paper records into digital form can provide business benefits to an organisation. However, before rushing into a scanning project, careful planning is needed to make sure that the results of the project are worth the investment involved. It is also needed so that the resulting digital copies together with their metadata can be maintained in a usable form for as long as they are required, which may be many decades.

5. HYBRID (MIXED PAPER AND DIGITAL) SYSTEMS

A hybrid system may be an appropriate strategy for organisations that have a medium or high state of digital recordkeeping readiness, as assessed using Guideline 13.

These days, organisations often need to manage paper and digital records at the same time. When an organisation is using both paper and digital systems to manage its records, that organisation is using a hybrid system. A hybrid system is not one that an organisation buys, but rather a combination of different recordkeeping systems (such as shared folders on a network drive and a paper-based filing system).

The requirements for managing a hybrid system differ from managing a purely paper recordkeeping system or apurely digital recordkeeping system. In a hybrid environment, it is necessary to create a 'marker' – a metadata profile of the physical record – in the digital system to control the paper record and to provide a link between the paper and digital systems. For example, when managing paper records using Sharepoint, the user creates a list item in Sharepoint, relates the list item to the paper file which is in a storage area, and manages the list item.

The management system used to manage the hybrid environment must address access, security, retention, disposal and control requirements for both digital records and paper. It must also provide the search functionality to locate both types of records.

Guideline 16 of this Toolkit provides checklists for systems and software products that can be used to assess the recordkeeping functionality of existing or proposed systems.

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5. Hybrid systems

Advantages:
- Allows flexible integration of various software tools.
- Can be a gradual pathway to an EDRMS.
- Can allow for management and retention of records that need to be retained in paper form for legal or other reasons.

Disadvantages:
- More complex to manage due to the differing requirements for paper and digital records.
- Requires users to make more choices regarding records and metadata capture.

Who might use this system?
Organisations that want to manage born-digital records in digital form, while retaining original paper records in paper form for legal or other reasons.

In certain circumstances digital copies of paper records may not be admissible as evidence in courts.

Summary:
Organisations receive and create records in both physical and digital formats. To manage records in only one format requires either printing of born-digital records onto paper, or scanning of paper records into digital form. Adopting a hybrid system avoids the need for staff to copy, print or reformat records for filing. It might also provide some legal guarantees when there are doubts about the legal admissibility of digital records. For hybrid systems to succeed it is important for a single records control system to be created and maintained which controls both the paper and the digital records.

6. ELECTRONIC DOCUMENT AND RECORDS MANAGEMENT SYSTEMS (EDRMS)

An electronic document and records management system may be an appropriate strategy for organisations that have a high state of digital recordkeeping readiness, as assessed using Guideline 13.

An electronic document and records management system (known as an EDRMS) is a software package designed to manage the large quantities of digital information that public offices create and receive every day. As the name indicates, an EDRMS combines document management (including version control) and records management functions in the one system. An EDRMS can be used to manage purely digital records and information (including emails, spreadsheets, text documents, and moving images), or, as we have seen in the previous section, to manage a hybrid system of digital information and paper records.

Successful implementation of an EDRMS involves much more than just the purchase and installation of the software. Like all information technology projects, implementation of a successful EDRMS depends on an organisation looking beyond the software and addressing a range of key issues such as the drivers or motivating factors for the software, the current operating environment, organisational culture, and resources.

It's worth remembering that only 20 per cent of the solution to information and records management challenges comes through the technology. When setting out a business case for an EDRMS it is important to map out the cost not just of software and implementation, but of maintenance and support of the system over time.

Resources will be required for:

- procurement – often in line with government or business requirements for procurement
- project support – includes management and consultancy, if required
- buying and installing hardware – includes server, scanners, systems backup and computer upgrades
- buying and installing software – includes EDRMS system, scanning, back-up, operating system, email interface
- technical support – IT staff, consultants or contractors if required, operational training
- administration – training, office support
- implementation – implementation costs include network, services, accommodation, policies and standards, design and analysis, development and testing, piloting, change management and roll out
- running and operations – maintenance of software and hardware, licences, consumables (paper, disks, tape), staff
- users – training at different levels

- migration – data migration (paper and digital) to ensure that records are accessible over time, costs of restoring or repairing lost or corrupted data (see Guideline 18: Digital Preservation for more details on data migration).

6. Electronic document and records management systems (EDRMS)

Advantages:
- Manages records throughout their lifetime – from the point of creation through to when they are no longer required for use.
- Increases efficiency – information is more readily available when needed.
- Increases accountability – through creating a complete record of official activities.
- Improves compliance with legislation.
- Reduces risk – by reducing the chance of lost or destroyed records, or records being accessed inappropriately.

Disadvantages:
- Licence fees for software may be very expensive. A sound and persuasive business case is required to justify the investment.
- Can be complex to use and administer.
- Can be disconnected from business processes, because records are often created in a business system or office software application and then copied into a separate EDRMS for records management purposes.
- Extensive investment in change management and user training is usually required to overcome user resistance to the system.
- Regular software upgrades are usually required and may be expensive
- After-sale vendor support may be inadequate.

Who might use this system?
Organisations with good IT infrastructure and technical support and adequate budgets that want to implement a comprehensive digital recordkeeping strategy.

Summary:
Well implemented EDRMS systems can deliver major improvements in the business and recordkeeping efficiencies of an organisation. They can, however, be difficult to implement successfully as they require a major commitment to organisational change management; high-level management, technical and records management support and oversight; ongoing quality assurance; and regular auditing and monitoring. As software licences are often expensive, a poorly implemented EDRMS can not only leave an organisation worse off than it otherwise would have been, it can also represent a major waste of public money.

As EDRMS systems are usually separate from core business systems, careful thought and planning needs to guide the integration of these separate systems and work processes. In the longer term it may be preferable for organisations to build recordkeeping functionality into their core business systems (this approach is covered in strategy 7) rather than rely on separate EDRMS systems that are dedicated solely to records management.

7. INCORPORATING RECORDKEEPING FUNCTIONALITY INTO BUSINESS SYSTEMS

Incorporating recordkeeping functionality into business systems may be an appropriate strategy for organisations that have a medium or high state of digital recordkeeping readiness, as assessed using Guideline 13.

Most organisations use a variety of dedicated systems to support one or more of their core business responsibilities. These systems are known as business systems. Examples of business systems include case management systems, content management systems, licensing systems and finance systems.

Ideally, these business systems should include sufficient recordkeeping functions to ensure that full and accurate records of important business activities and transactions are captured and retained for as long as they are needed.

In reality, business systems usually lack adequate recordkeeping functionality. One reason for this is that business systems often emphasise the importance of maintaining current and up-to-date information in database tables. Records, however, need to be fixed in time and should not be able to be amended in any way, otherwise their value as authentic evidence of past activities is lost. Part of the appeal of an EDRMS system is that it allows records created in a business system to be copied into an EDRMS for recordkeeping purposes. However, it is inefficient to copy records from a business system to an EDRMS as it creates extra work for staff. There is also always the risk that important records created in a business system may not be captured into the EDRMS by users and consequently not retained and managed as records by an organisation.

The best time to address functional recordkeeping requirements in business systems is when new systems are being designed or implemented. It is more difficult, though not necessarily impossible, to enhance the recordkeeping functionality of existing business systems. Guideline 16 of this Toolkit provides checklists for systems and software products that can be used to assess the recordkeeping functions of existing or proposed systems. It is based on the more comprehensive ICA-Req Module 3 – The International Council on Archives' *Principles and Functional Requirements for Records in Digital Office Environments, Module 3: Guidelines and Functional Requirements for Records in Business Systems* (also published by the International Standards Organization as ISO 16175-3, 2010).

To successfully incorporate recordkeeping functionality into business systems it is necessary for records managers, business owners and IT professionals to cooperate to deliver systems that meet both core business and recordkeeping requirements.

7. Incorporating recordkeeping functionality into business systems

Advantages:
- Enables records to be made and kept within the same system.
- Can provide greater certainty that important records will be made and kept as records.

Disadvantages:
- Incorporating recordkeeping functionality into business systems may be difficult and expensive, requiring complex system redesign and re-engineering.
- Records managers may not have sufficient influence within their organisation to convince business and IT managers of the benefits.

Who might use this system?
Organisations that want to manage born-digital records in digital form within the business systems that create the records as evidence of business activity.

Summary:
This strategy is considered the gold standard of digital recordkeeping, but it will not always be easy or possible. Success depends on having a good understanding of an organisation's work processes and recordkeeping requirements, good IT infrastructure and skilled IT staff, together with a strong level of support for good recordkeeping in the organisation.

APPENDIX A – TIPS FOR MANAGING SHARED FOLDERS

- Create a clear policy and procedures for staff on using shared folders. This should include key information such as which records and documents need to be captured to folders, and how disposal or deletion of records will take place. Any procedures or rules should be written simply and be available to all staff via a centralised access point such as a staff intranet.

- Create logical filing structures for information in shared folders. A typical filing structure is hierarchical, with three levels of folders that reflect the functions, activities and transactions of an organisation, and a fourth and final level below these where the records are captured. Having a filing structure on a shared drive reduces the risk of records and information getting lost, and aids consistency by preventing users from creating their own folder structures that are different from what is used in the rest of the organisation. This method also allows an organisation to put into place disposal schedules or rules for deleting information, and apply these consistently across groups of records.

- Determine how folders and the documents within them should be titled. Naming conventions need to apply to folders at different levels of the structure, and should be easy to understand and use. The folder titles should be aligned to the organisation's business classification scheme if one exists.

- Establish suitable restrictions and controls for workgroups or folders within shared drives. Access controls will determine who can access and capture records as well as access and create new folders. Consider applying controls to prevent the unauthorised creation of top or mid-level folders, while allowing more freedom at lower levels.

- Assign responsibilities for managing the shared folders and making sure that the filing structure is maintained.

- Consider whether some folders containing sensitive information may need to be removed from shared drives or secured and hidden from view except to those groups who have the correct levels of authorization.

- Provide training and assistance for users of shared folders, and staff with responsibilities for creating or managing folders.

APPENDIX B – TRENDS AND ISSUES IN DIGITAL RECORDKEEPING

Deciding on the right digital recordkeeping strategy for your organisation is made even more difficult due to the pace of change and developments within the IT environment. Two emerging trends that may impact upon the decisions your organisation makes when choosing a strategy for digital records are open-source software applications and cloud computing.

The open source alternative

A growing trend in the software industry is the development and use of 'open source' software applications. The key differences between open source software and commercial and proprietary software are:

- Open source software is usually developed by a community of software developers in a transparent web environment, whereas commercial or proprietary software is developed by software developers working for a software company.
- Open source software can be downloaded over the internet free of charge, subject to certain licensing conditions and constraints, whereas commercial or proprietary software has to be bought through annual licensing fees paid to a software vendor.

While open source software is free of any licensing fees, it is not necessarily cost-free to implement. There are companies that make their profits by working with organisations to help them implement open source software applications. For more complex open source applications such as those for EDRMS or Content Management Systems, it is often advisable to pay for some external help implementing the software.

Supporters of open source software argue that open source is generally more flexible and transparent than proprietary software, which can be inflexible and difficult to understand. This is because the source code and accompanying documentation for open source software is openly available over the internet, whereas the source code for proprietary software is kept as both a valuable commercial secret and privately owned intellectual property.

Supporters of proprietary software argue that it is reliable, safe from viruses and other threats, and comes with professional support and training as part of the package.

There are many open source applications available over the internet. These vary widely in quality: just because something is open source does not mean it is good. Great care needs to be exercised in deciding which open source application to use. A commonly used open source application for document, records and content management is Alfresco.

Advantages:
- Free of licensing fees.
- Source code and supporting documentation are freely available.
- Compared with using closed proprietary software applications, using open source software does not make your organisation dependent upon the services of a particular software vendor.
- Information created using open source is generally easier to preserve over the long term, because it is less vulnerable to becoming obsolete in versions of software that are no longer supported by proprietary vendors.

Disadvantages:
- As there is no 'vendor' for open source products there may be no company that is able to provide technical support for the application.
- While the software is free of annual licensing fees, it is often not cost-free to implement.

'Cloud computing' and digital recordkeeping

Another growing IT trend is the use of 'cloud computing'. Cloud computing is internet-based computing, where shared servers provide resources, software, and data to organisations on demand. Generally, cloud computing customers do not own the physical infrastructure, instead they rent usage from a third-party provider. Renting usage helps the organisation avoid large costs, as they pay only for resources that they use.

Common examples of users of cloud computing include:
- internet-based data storage providers
- web-enabled email providers such as gmail
- cloud-based social networking sites such as Facebook and Flickr for online communication and information storage and management purposes.

A key feature of the 'cloud' is that you can never really be sure where it exists. It may be California, India or China – anywhere and/or nowhere! Wherever the information is stored, it is likely to be beyond the control of your country's laws and courts. Organisations using cloud computing should conduct a risk assessment that examines the risks associated with storing any vital records in the 'cloud'. These risks include:

- Limited control over organisational information. If the only place that a business email, document or other communication is stored is in the 'cloud', the organisation risks losing control of that information.
- How to keep information secure from unauthorised access, use or tampering.
- How to retrieve data if the cloud-based service goes out of business.

Steps for reducing high risks include making copies of vital records for storing and managing in systems and storage devices owned by your organisation or

government and kept within your own country. Another approach is to negotiate contractual arrangements with the cloud-based service provider that protect the interests and information assets of your organisation. In practice, however, this is often very difficult, if not impossible, to achieve.

Advantages:
- Cheap and easy to use, requiring little in-house organisational IT infrastructure.

Disadvantages:
- Vital organisational records may be outside the control of your organisation, your government and your county's legal system.
- Vital organisational records may be deleted, lost, copied or tampered with without your organisation's knowledge and without your organisation being able to do anything about it.