It's a Digital World

Records and Information
Management Professionals

Guide to
Avoiding the Digital Dark Age

By Linda Shave

It's a Digital World

Records and Information Management Professionals
Guide to Avoiding the Digital Dark Age

Copyright© by Linda Shave

Notice of rights

Notice of Liability

Trademarks

Table of Content

Introduction

Web 3.0 semantic web is the third decade of the web and the next step in the evolution of the 'intelligent web' and will introduce a new 'digital' information age for business. In this era of the all-pervasive cloud and the Internet-of-Things (IoT), it is taken for granted that the digital data we capture and store will be preserved forever.

In the context of this guide the term 'professionals' is all-encompassing to include record and information management professionals, consultants, archivist, librarians and curators. The term 'executives' is all-encompassing to include Board Members, CEOs, CFOs, CIOs, CSOs and the new emerging player in the field the digital risk officer (DRO).

According to Gartner the DRO will require a mix of business expertise and the necessary technical knowledge to assess and make recommendations for appropriately addressing digital business risk.

About this guide

This Records and Information Management Professionals Guide to Avoiding the Digital Dark Age introduces the theory of 'Digital Perpetuation', 'Active Preservation' and Digital Risk Management, for professionals. Historically, preservation technologies have been associated with solutions for Archivist, Curators, Librarians and Record Managers. Digital perpetuation and digital risk management will sit in the domain of executives.

The author believes that 'active preservation' in the context of 'digital perpetuation' of digital data assets is a future growth area that will provide new opportunities to professionals and justifies a more in-depth coverage.

Chapter 1

The Next Generation Digital Enterprise

➢   Web 3.0 Semantic Web

➢   A new 'digital' information age

➢   What is digital?

➢   Digital dilemmas

• Web 3.0 Semantic web

Web 3.0 semantic web is the third decade of the web and the next step in the evolution of the 'intelligent web'. Web 3.0 will continue to expand connectivity of devices beyond smartphones, tablets and PCs to the Internet-of-things. Web 3.0 is and will continue to destroy old models of enterprise operation, disrupting and changing business, jobs and lives.

• A new 'digital' information age

Web 3.0 will introduce a new 'digital' information age for business as semantic technologies add meaning to linked data, open up access to data sources and combine information from disparate sources. The predominance of digital data assets will provide supremacy in the new digital economy, the challenge will be how to sieve through the volumes of digital data, find, read and unlock its value given the fast pace of technology change and the shortening of time to obsolescence.

The key to competing in the global digital economy is business model innovation. Executives in all industries ought to be looking for new business rules, tools and

techniques to exploit semantic web enabled technologies and 'digital' data assets in order to transform themselves into the next generation digital enterprise.

• What is digital?

In today's hyper connected 'digital' world, the internet of things (IoT), cloud-based offerings, cloud deployment models and the interconnection between people and mobile technologies, large volumes of 'digital' data is being created. This digital data is generated, stored, processed and transmitted with digital technologies using a series of ones and zeros (bits and bytes) which encode words, music, images, applications, documents, web browsers and databases. This method of computation is also known as a binary system.

So what is digital? Basically, 'digital' means something that fundamentally is a string of ones and zeros. Such binary codes of ones and zeros can be encoded into words, music, images, applications, documents, web browsers or databases.

• Digital dilemmas?

The digital data explosion will bring similar dilemmas as those associated with Big Data. A point of difference might be the warp speed of technology advancements accelerating the speed in which storage formats, digital data formats and technology become obsolete. Moreover, digital data can be prone to unseen damage where a 1 (one) may randomly change to a 0 (zero) due to digital obsolescence. Other factors, such as business trends to swap from one Software as a Service (SaaS) product to another, will require numerous migrations between applications creating a potential risk called bit-flip or bit-rot.

Bit rot is insidious and can be due to bits in the files being 'flipped' producing minor errors that are impossible to correct making data/files unreadable into the future creating a possible 'digital dark age'.

The digital dark age principle argues that the rapid evolution of technology will eventually make storage formats obsolete, and data will not be accessible to generations to come. The 'digital dark age' is aptly defined by Wikipedia "The digital dark age is a possible future situation where it will be difficult or impossible to read historical electronic documents and multimedia, because they have been in an obsolete and obscure file format." This phenomenon according to "the father of the Internet", Vinton Cerf, is 'bit rot'.

Therefore, obsolescence and 'bit rot' pose a major threat to the survival of digital data assets and the continued existence of the business. Professionals and organisation are at a new crossroad requiring new business models, management strategies and tactics for a digital foundation.

Professionals should be proactive and take the first step by understanding what 'digital perpetuation' is and how as professionals you might be able to use this knowledge to work with management to review existing strategic plans and digital strategies.

Chapter 2

Digital Asset Management

➢ Digital asset life cycles

➢ Digital risk and digital risk management

➢ What is data-driven-decision making?

• Digital asset life cycles

To comprehend the digital lifecycle, one needs to identify and understand what digital assets are. As we move to Cloud solutions there is an expectation that applications, digital assets and data will be available anytime, anywhere, any place. Digital assets can be words, music, photos, videos, audio, documents, presentations, applications, web browsers and databases. Managing these digital assets requires understanding the four phases of the digital asset lifecycle (Table 1):

Create	Creating the data/content and storing it in a defined storage location and/or content management system' (Enterprise Content Management, Digital Asset Management, Cloud Storage etc.).
Manage	Including capture (ingest), version controls, metadata, approvals, appraisal, classification, retentions, accessibility and security.
Distribute	Internal and external groups that may be involved/part of the workflow process.
Preserve	Preservation of digital assets short or long term as well as active perpetuation to preserve digital assets from obsolescence.

Table 1 – The four phases of the digital lifecycle.

• Digital risk and digital risk management

The digital era brings a paradigm shift. Digital risk is a term describing the risks arising from increased dependency on information technology systems and digital processes. It will become a major challenge for the new evolving executive role of 'digital' risk officer.

Executives are accountable for both operational performance and achieving strategic objectives. Digital risk management is the next evolution in 'digital risk and security strategies'. It is about re-defining corporate governance and 'digital perpetuation' and should form part of the digital risk management plan.

Table 2, outlines some of the areas that may need consideration in a Digital Risk Management Plan.

Category	Brief Description	Digital Risk Management (Strategy Component)
Obsolescence	Digital Perpetuation – Active preservation against storage formats, digital data formats and technology becoming obsolete.	Digital Risk Strategy
Digital Bit Rot	Digital Perpetuation – Active preservation against unforeseen damage such as bit-flip or bit-rot.	Digital Risk Strategy
Intellectual Property (IP) and Assets	Digital Security - Protecting Enterprise IP and assets to ensure ongoing enterprise sustainability.	Digital Security Strategy
Cyber Defence	Digital Security - Identify and understand cyber security threats to secure business operations.	Digital Security Strategy

Table 2 – Components for consideration in a Digital Risk Management Plan

• What is data-driven-decision making?

Data Driven Decision Making in brief, is an approach to business governance that values decisions based on and backed up by data that can be authenticated. The success of the data-driven approach is reliant upon the availability of data, the quality of the data gathered and the effectiveness of its analysis, interpretation and use.

Data Driven Decision Making can be categorised into four groupings (Table 3):

Data Decision Group	Description
Availability	Digital data should be available when and where it is required.
Accuracy & Reliability	Digital data must be accurate and reliable.
Analysis	Digital data needs analytic tools to be able identify the value of the digital data.
Usability	Digital data needs to be in a usable format if it is to be successfully used in decision making.

Table 3 – Data Driven Decision Making four groups

Chapter 3

Digital Perpetuation

➢   What is digital perpetuation

➢   Analytical tools for digital perpetuation

- ### What is digital perpetuation?

   Executives and professionals need to understand the difference between digital perpetuation and digital preservation.   Digital perpetuation is the process of 'actively' preserving digital data assets from 'obsolescence' and 'bit rot'. Digital perpetuation will be an essential process for business not only for their continued existence into the future.

   Digital preservation is the formal task of ensuring that digital information such as archives, books, collections, artefacts, analogue, digitised and born digital records of continuing value remain findable, accessible, readable and usable. It is usually the domain of information and record management professionals, archivist, librarians and curators.

   The following definitions have been sourced from the internet and may help in understanding the differences.

What is Preservation? Meaning/definition - Cambridge English Dictionary.	The act of keeping something the same or of preventing it from being damaged.
What is Perpetuation? Meaning/definition - Askdefine online English dictionary.	The act of prolonging something**;** "there was an indefinite prolongation of ... The act of prolonging existence, of keeping something alive or active**.**

Table 4, highlights the people, process and technologies used in digital perpetuation and digital preservation. As we move to Web3.0 and beyond, digital perpetuation will have a heavy dependency on analytical tools for managing, assessing and reporting on the continued value of digital assets to the business, much the same way as Big Data analytics.

Whilst the same active preservation and analytic tools might be used for both digital perpetuation and digital preservation, how they are applied will be fundamentally different. Digital perpetuation analytical tools will be essential for enterprise profitability and continued sustainability.

Accountability	Culpability	Activity	Technology/Tools
Executives and Digital Risk Officer.	**Digital Perpetuation** Enterprise (Private and Public)	**Active preservation.** Digital data assets & Digital Risk Management.	Automated 'active preservation' technologies and analytic tools for enterprise profitability and continued sustainability.
Responsibility	**Task**	**Activity**	**Technology/Tools**
Archivist, Curators, Librarians & Record Managers.	**Digital Preservation** Archives, Educational Institutions, Libraries & Museums.	**Archiving and Long Term Preservation.** Archives, Books/ Collections, Records & Artefacts.	Technology tools for managing the process of long term preservation.

Table 4 - People, process and technologies for digital perpetuation and digital preservation.

- **Analytical tools for digital perpetuation**

  Web3.0 will see a continued explosion of digital data being created. This will bring about a new set of challenges for digital data asset management. In addition, to benefit realisation of digital perpetuation, competitive advantages will be accomplished by using analytic tools for analysing both structure and unstructured digital data to identify its continued value, improve market shares and remain competitive.

  Cloud-based storage and the interoperability between software as a service (SaaS) will provide new efficiencies in storing, managing and accessing digital data. This will provide new platforms, opportunities and capabilities for introducing the use of analytical tools for professionals.

Chapter 4

Active Preservation

➢   The dynamic global world has moved to digital

➢   Active Preservation

- ### The dynamic global world has moved to digital

    As previously highlighted, 'obsolescence' and 'bit rot' pose a major threat to the survival of digital data. The continued existence of the business is threatened as we move to Web 3.0 semantic technologies and the new digital information age.

    In many instances, executives and professionals are still catching up with Web 2.0 the second generation web that they have failed to see that the dynamic global world is and has moved to Web 3.0. Web 3.0 is about digital content creation, using infrastructure as a service (IaaS), software as a service (SaaS), platform as a service (PaaS) and hosted cloud models.

    Consequently, the topic digital perpetuation and the inclusion of 'active preservation' for digital data should be a high priority for all executives and professionals as it directly impacts competitiveness and business survival.

- **Active Preservation**

  Active preservation technologies provide a way to proactively manage and migrate file formats as they become obsolete and protect against the bit rot threat.

  Analytical tools will manage, assess and report on the continued value of digital assets to the business. How active preservation and analytic tools are applied for digital perpetuation will be fundamentally different. Digital perpetuation will utilise analytic tools for analysing both structure and unstructured digital data to identify its continued value, improve market shares and remain competitive.

Chapter 5

What to do next

➢ Having a holistic view of the enterprise

➢ Building a digital risk team

- ### Having a holistic view of the enterprise

  More than ever before it is necessary to have a holistic view of the enterprise. No longer can we think or operate our business in silos. Just as society is moving to a connected society so must business as digital data assets crisscross all business boundaries they must be managed appropriately.

- ### Building a digital risk team

  As previously indicated the digital dark age principle argues that the rapid evolution of technology will eventually make storage formats obsolete, and data will not be accessible to generations to come. The digital era also brings a paradigm shift requiring new business model innovation that exploits the use of the Internet of Things (IoT).

  Therefore, obsolescence and 'bit rot' pose a major threat to the survival of digital data assets and the continued existence of the business. Professionals are at a new crossroad, there is an opportunity for 'professionals' to place digital perpetuation into their digital records management plans, introduce analytical tools as a core competency for digital data-driven decision making and expand current roles or

transition to new evolving roles. We need to start dialog with the business, build and play a key role in the developing, implementing and maintaining 'digital risk teams' to address digital asset management risks arising from the increased dependency on technology, the speed of technology obsolesces and the possible risk of bit rot.
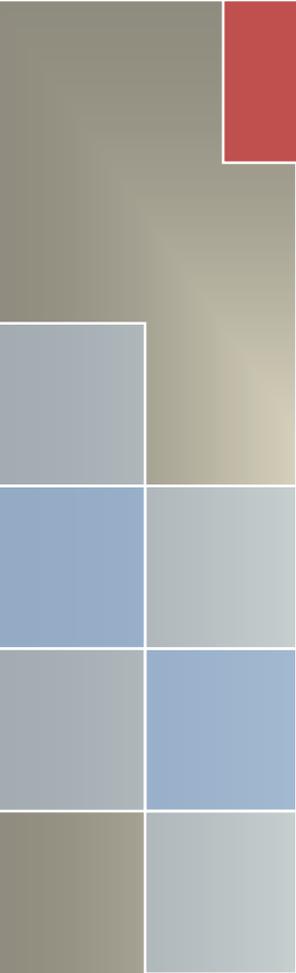
It's a Digital World

Records and Information Management Professionals

Guide to Avoiding the Digital Dark Age

As we move to the third generation Web3.0 business will face challenges of data perpetuation, that is protecting their digital data from technology obsolesces and bit rot.

This guide is a must-read for all Records and Information Management Professionals wanting to better understand how they might protect their digital assets for the continued existence of their business in the global digital economy.

BizWyse® Consulting
Linda.shave@bigpond.com

Linda Shave, BizWyse®, 2015