

e-Library Science Research Journal

International Recognition

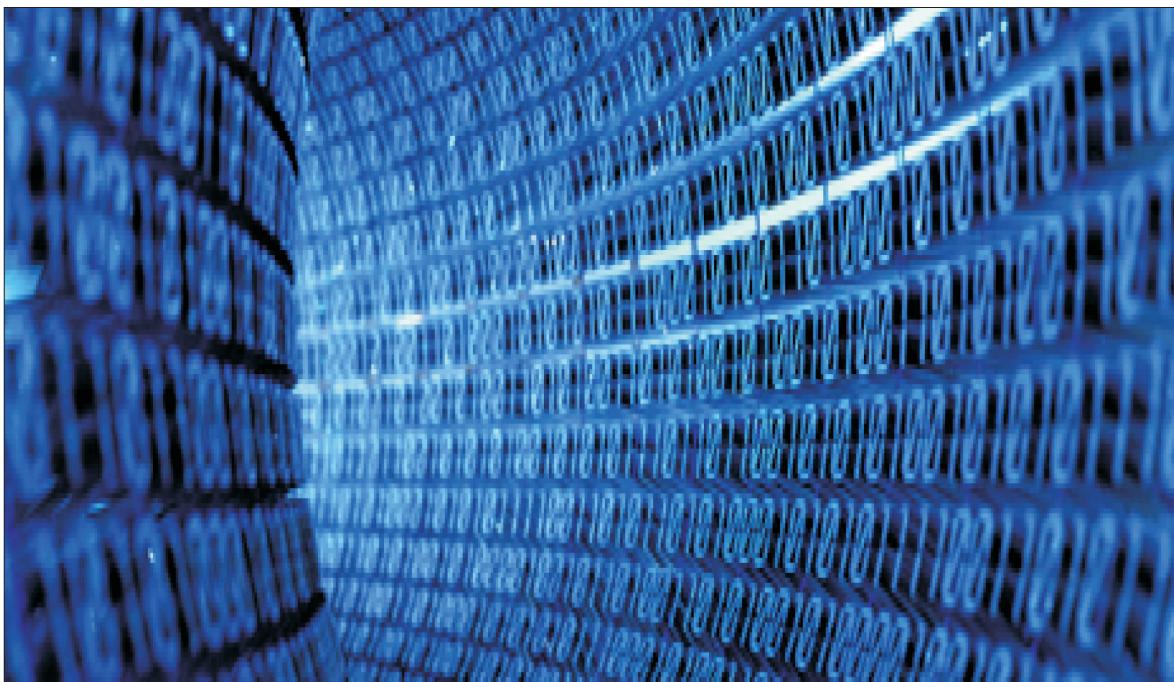
ISSN: 2319-8435

Impact Factor : 2.2030(UIF)

Volume - 4 | Issue - 5 | March - 2016



DIGITAL PRESERVATION: AN OVERVIEW



Ambika¹ and Khaiser Nikam²

¹Research Scholar, Dos in Library and Information Science, University of Mysore,
Mysore Manasagangothri.

²Professor, Dos in Library and Information Science, University of Mysore,
Mysore Manasagangothri.

ABSTRACT:

The research of the future requires access to the research of the past. This access cannot be assured without reliable long-term preservation of scholarly digital content. Near-term access can be guaranteed with backup and access system redundancy. Mid-term access can be protected with byte replication. But assurance of long-term access requires digital preservation – the series of management policies and activities necessary to ensure the enduring usability, authenticity, discoverability, and accessibility of content over the very long term. Portico, with a mission to preserve scholarly digital content, is one organization providing such long-term digital preservation.

KEYWORDS: Digital Preservation; Digital achieves; digital process

INTRODUCTION:

The digital birth of cultural content and conversion of analogue originals into bits and bytes has opened new vistas and extend horizons in every direction, providing access and opportunities for new audiences, enlightenment, entertainment and education in ways unimaginable a mere 15 years ago. Digital libraries have a major function to enhance our appreciation of or engagement with culture and often lead the way in this new digital domain we find ourselves immersed within. The underlying information and communication technologies are still generally referred to as 'new' or 'high' technologies-they remain highly visible, and have not yet, despite their pervasiveness, become part of the natural infrastructure of society. 'Technology', as still the computer scientist Bran Ferren memorably defined it, is 'stuff that doesn't work yet' (Adams, 1999).

The need to deliver cultural resources, especially from major cultural organizations such as museums or national libraries, has become an imperative closely associated with the core mission of these organizations to educate and elucidate, to promote and disseminate and to preserve culture. These attempts to reach out to new audiences and to refresh current audiences are major driving factors behind many digitization programmes and the shift towards digital repositories. The justifications for delivering cultural resources digital can rarely be made on purely financial grounds as the fiscal returns on investment are relatively small, but the returns for culture, education and prestige are high (Tanner, 2004).

The subject of digital preservation is one that is often represented as being distinctly different from more traditional preservation issues due to the digital component. In many ways this is true but an exploration of the core concepts and principles driving preservation imperatives in both the digital and non-digital domains provides a useful introduction.

The scale of the digital preservation problem

'Culture, any culture... depends on the quality of its record of knowledge' (waters, 1997). As Waters points out, any society depends on the quality of its knowledge of its own past and a falsification of that past whether deliberate or accidental damages the society. The Soviet Union is a prime example of a society which rewrote its history regularly to reflect the prevailing political mores, destroying valuable evidence along the way (Task Force on Archiving, 1996, 1). Lack of care in preserving our digital past and present will certainly ensure that we now face a new threat in the form of digital obsolescence: Not brittle papyrus and crumbling mortar is the most severe threat to our cultural heritage today, but, as Mary Feeney expressed it, 'the death of the digit.' This 'death of the digit' is related primarily to two factors:

- First, technology develops ever more rapidly, reducing the time before a particular technology becomes obsolete.
- And secondly, unlike their analogue counterparts, digital resources are much more 'unstable' with the effect that the integrity and authenticity of digital cultural resources is corrupted.

Authenticity digital data

Authenticity of digital documents must be distinguished from authentication as generally defined in the digital world. Mackenzie defines 'authenticity' of a documentary source as 'reliability over time' while 'authentication' is a term usually used for the process of validating who is allowed access to digital data, and what they might be permitted to do with it. As Rothenberg has pointed out, 'whenever informational entities are used, and for whatever purpose their suitability relies on their authenticity' and goes on to remark, 'the technological issues surrounding the preservation of digital

information entities interact with authenticity in novel and profound ways'. This is a key and crucial issue in the preservation of digital data, as validating authenticity is so much more problematic than in the analogue world. It is frighteningly easy to change a digital document, leaving no trace, no ghostly palimpsest to tell us what was there before. If we alter the words on a written document, generally we can decipher the original and the changes become part of the cultural accretion of meaning gained by the document. A digital document always appears pristine, despite changes made by accident or design, and this means that if two readers are discussing a document, they may not always know that they are using the same version, or if there has been some hidden change. One major consequence of this is that digital data may not be legally valid, and an analogue version may need to be stored for legislative purposes.

Methods of preservation of digital materials

As is clear from the discussions above, the paradox of digital materials is that they are fundamentally simple, being made up of only two electrical states, but those states can be configured into patterns so complex when using programming techniques that a limitless number of different documents and other artefacts can be represented. Digital data derived from different sources differ greatly in the amount of storage needed. Electronic text, even with complex encoding, is compact; still images can be very space hungry, with digital cameras now available which can capture files of 400 Mb or more from visually rich objects; sound and video, especially if captured at high quality, take much more storage than images or complex maps created with GIS systems can be even larger. While file sizes can be reduced to some degree by compression of the data, the compression techniques which offer the greatest economies have the disadvantage of the loss of information.

There is also a great variety of media on which digital materials can be stored, from punch cards and tapes which represent the patterns as a series of holes, to the wide range of electronic recording materials: floppy disks, hard drives, tapes CD-ROMs, DVDs etc. The methods of digital preservation or digital archiving we introduce here and which are discussed in more depth in this book are:

- Technology preservation
- Refreshing
- Migration and reformatting
- Emulation
- Data archaeology
- Output to analogue media.

Technology preservation

Technology preservation is the maintenance of the hardware and software platforms which support a digital resource; if adopted as a preservation strategy it would need to be accompanied by a regular cycle of media refreshing. It is relatively impractical and financially unfeasible, given the large number of computers and programs which would need to be managed over a long period of time: 'any collection manager in charge of a large collection of digital resources who relied solely on this strategy would very soon end up with a museum of ageing and incompatible computer hardware'. One can imagine a library reading room littered with PCs with every version of Windows and Macintoshes running ten generations of operating system; that is to name just two current platforms. For certain rare and important resources, perhaps the technology could be preserved for a time, until a better long-term solution could be found, but is an approach clearly fraught with difficulty.

Preservation metadata

Whatever strategies or techniques are adopted to preserve digital data, they will be successful only if the data are fully documented throughout their lifecycle. This is a strategic issue for data creators and curators, and one which has long-term organizational

Rights management

Issues of intellectual property rights and copyright will need to be considered when preserving digital materials for long-term access and it may be necessary to obtain permission from the rights holders for any reformatting. Given that laws, customs and practices differ from country to country, we offer no particular examples here, but merely warn that this will be an issue that librarians must consider when preserving, reformatting or even emulating data. As Day points out:

Solving rights management issues will be vital in any digital preservation programme. Typically, custodial organization does not have physical custody of digital objects created or made available by other stakeholders (e.g. authors or publishers). Instead they will negotiate rights to this information objects will also need to be negotiated with rights holders and any such agreement may, or may not, permit end user access. A digital archive will have to collect and store any relevant rights management information which could be stored as part of the descriptive metadata.

Copyright

Copyright applies to work that is recorded in some way. Right for musical and dramatic work as well as films, sound recording literary, artistic or typographic arrangements. It gives author/creator specific rights in relation to the work, prohibits unauthorized actions (mainly copying or broadcasting), and allows the author to take legal action against such infringements.

In the UK and much of the western world, a person's work is automatically copyrighted. As a result there is rarely such a thing as copyright-free material so, even where no action has been taken to register or claim copyright, there is a copyright issue to be addressed however, some material may have had its rights waived (such as certain kinds of public documents) or the rights may have expired.

The issues for copyright in digital preservation are:

- Under what circumstances does the preserving organization have the right or permission to ingest the content into the preservation system or storage environment? This activity may be deemed illegal copying under copyright laws unless the permissions to store and make available have been clearly agreed, with associated written evidence.
- Especially for moving image and sound recordings there may be many creators and copyright holders. For instance, the background music for a documentary may have different restrictions on use from the visual content, and each of these will have to be addressed.
- There may restrictions on the separation of elements of a work or their independent use, for example, removing a sound track from the visual track or GIS data from satellite imagery.

Valuing digital preservation

It can be argued that concerns about the immediate value of digital preservation have created one of the most significant barriers to organizations developing their own digital preservation programmes. In the context of a rapidly changing and volatile environment, and the constant backdrop of the need for accountability and restraint in spending, it is understandable that managers have been likely to exercise caution before embarking on such a programme. Aschenbrenner and Kaiser (2005) suggest that 'costs of a digital repository are hard to calculate due to the lack of hands-on data from

other initiatives...the lack of experience with digital preservation costs obstructs a complete picture'.

While there is a strong growth in the general application of digital preservation technologies and techniques, we have yet to see a maturing of the economic basis for this activity. Mainly this is due to the costing assumptions used by institutions different significantly from each other. Differences include the means of estimating. The cost of labour and infrastructure, the cost of investment and expected returns and how costs are allocated between distinct activities that share resources.

Most of the published material relates to cost models, rather than fully fledged business models. A cost model provides a framework in which all costs can be recorded and allocated or apportioned to specific activities. A business model shows how the service functions and outlines the method by which it can sustain itself. This involves both strategy and implementation.

However, a number of factors have begun to emerge in a gradual shift away from an apparently stark choice of yes/no in the decision to develop a digital preservation programme. These factors can be broadly summarized into:

- Growing awareness of loss/risk of loss of digital materials
- Growing awareness of the brief timeframe during which action can be taken
- Increasing dependence on digital materials
- Increasing understanding of cost elements
- Increasing number of case studies with practical models for identifying costs
- Increased awareness and understanding of lifecycle management and a cyclical/iterative approach
- Increased influence of the Open Archival Information System (OAIS) model.

CONCLUSION:

The preservation of the written heritage in whatever format it is being produced is of crucial significance to civilized society. Given that it is so important, and that there are many strategic factors and costs which need to be established and predicted for the long term, it is an area where there are many uncertainties. Issues are hotly debated (sometimes in a wide public arena, as described above in the context adherents and opponents).

REFERENCES:

1. Marilyn deegan and Simon 2006. Key issues in digital preservation, London, facet publishing, pp. 1-32.
2. Adams, D. (1999) How to stop worrying and learn to love the Internet, The Sunday Times, (29 August)
3. Tanners, S.(2004) Reproduction Charging Models and Rights Policy for Digital Images in American Art Museums (a Mellon Foundation study),
4. Whaters , D.J. (ed) (1997) Digital Archiving: the report of the CPA/RLG Task Force. In Preservation and Digital and digitization: principles, practices and policies, London, National Preservation Office.
5. Aschenbrenner, A. And Kaiser, M. (2005) White Paper on Digital Repositories, Innsbruck, reUSE Project,
6. <http://www.lib.umich.edu/preservation-and-conservation/digital-preservation/what-digital-preservation>
7. <https://www.hathitrust.org/preservation>
8. <http://www.portico.org/digital-preservation/wp-content/uploads/2010/01/ALPSP-FINAL-Kirchhoff.pdf>