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Long-term Digital Preservation

DRI is a trusted digital repository (TDR)

As a TDR, we are acutely aware of the problems and risks associated with long-term digital preservation and the activities required to provide sustained access to digital objects.

Digital Fragility & Dependency

The fundamental problem associated with long-term digital preservation is the volatile nature of the digital medium and the inherent reliance on peripheral resources (e.g. software and hardware) to access and display digital objects. Digital objects are fragile and open to corruption.

Hardware and Software

Most analogue objects, such as printed ephemera, documents, books, etc., can be used and referenced in and of themselves. Digital objects, however, are software and hardware dependent and therefore only function within certain environments. For example, a printed book can be read without the

printing press - it is functionally independent. An ebook, however, can only be reused within a certain context - on a particular device, through a particular programme.

When we preserve digital objects we are essentially preserving access to, and the functionality of, that object. A digital file may exist on a storage medium but that does not guarantee that we can access the contents of that file. Therefore, additional back ups or replication of a digital object does not constitute digital preservation - although it is part of the overall process.

Volatility and Degradation

The volatile nature of storage media (magnetic or optical) and the degradation of software (if it is not maintained) contributes to the corruption of the data or the process known as 'bit rot' or 'bit flip'. This corruption can render a digital object inaccessible. It is in this respect that digital preservation cannot be a retrospective activity. Therefore, when we speak of long-term

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digital preservation we are essentially referring to a number of short-term activities, processes, and procedures that ensure continuous access to digital content.

What are these short-term activities?

From a technical perspective DRI has implemented a number of validation processes that ensure data integrity and bit-level preservation. These will guard against bit rot on a per-object basis and across the entire repository. We also have procedures in place to monitor changes to software or hardware in order to upgrade or migrate these components as necessary. In addition, strategic format shifting or migration from obsolete file formats preempts irreversible file corruption and incompatibilities.

Our federated storage infrastructure is an integral part of our disaster recovery procedure and is essential to the provision of a robust and reliable service. It provides an uninterrupted service to users since copies of the repository are held across multiple partner institutions. Our backup procedures include replication of digital objects in the repository as well as the repository infrastructure itself, and our audit processes ensure data authenticity. Capturing preservation metadata, which tracks, among other things, any changes to an object, is also an integral part of this process. DRI is also minting DOIs (digital object identifiers) to uniquely identify content and provide persistent citations.

This technical perspective, however, is but one aspect of the overall long-term digital preservation process - the above description is neither exhaustive nor the complete picture.

In addition to the technical solution, there are numerous business and policy strategies and procedures that are integral to long term digital preservation. These include business continuity (staff, infrastructure, funding) and skills development, written policies and statements that outline security protocols (in case of fire, theft or malicious damage to the storage infrastructures), version control procedures, and disaster recovery protocols.

Play Your Part

Long-term digital preservation therefore is a series of activities, but it's not the responsibility of a repository alone; the broader community has to be involved. Data owners should audit their collections, monitor file formats, and consider depositing with a trusted digital repository such as DRI. Engaging in digital preservation requires your active participation, and DRI is regularly releasing guidelines and fact sheets to provide assistance in various areas (e.g. metadata, file formats, copyright and licensing...). See www.dri.ie/publications for more information.

