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Why Publish Digital Successions

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Abstract

STAGE: Draft. Feedback welcome.

Digital successions offer benefits beyond preprints. They can be used for other document types, such as supplemental material and technical blog posts. Additionally, researchers can access these citable documents through multiple compatible websites and software applications. Despite being distributed across independent platforms, authors still retain exclusive control to amend their digital successions. Digital successions also provide key benefits of preprints, including long-term preservation through archiving, preservation of multiple document versions, and the ability for authors to add new document versions. This allows the research community to cite specific fixed versions while also having the option to discover newer versions.

Summary

Digital successions are preserved in Git-compatible [1] repositories and archives. Three such examples are the Software Heritage Archive, GitHub, and GitLab. See the Relationship to Git section for more details. The data archived is the machine-readable content of a document separated from how it is visually presented. The benefits of this separation are discussed in the Diversity of Reading Venues section. A key component to making separation possible is discussed in the Digital Succession Identifiers (DSI) section. These identifiers can be used for bibliographic references similar to a DOI [2]. This extends one of the great features of traditional academic publishing, namely the ability of researchers to reference a static archived document long into the future.

Diversity of Reading Venues

Multiple independent websites and applications can access a digital succession to present the documents contained in the digital succession in various ways. Digital successions are not tied to a single website, allowing readers the freedom to choose between alternative reading venues.

As of 2023, the primary application for digital successions is baseprints [3] based on JATS XML [4]. A digital succession of baseprints gives readers the choice between multiple PDF and web page formats, similar to the choice between PubMed Central and journal websites.

Digital Succession Identifiers

A Digital Succession Identifier (DSI) [5] is an intrinsic persistent identifier [6] of a digital succession. It is a textual identifier similar to a DOI [2] or a web address URL. This document is archived in the digital succession with DSI:

`dsi:wk1LzCaCSKkIvLAYObAvaoLNGPc`

This is a *base DSI*, which identifies all contents of a digital succession, both current and future. Similar to textbooks and preprints, digital successions contain multiple editions (or versions) of a digital object such as a baseprint [3]. A base DSI identifies all the editions of a document added to a digital succession. Usually, readers are interested in the latest edition in the digital succession.

An edition number can follow a *base DSI* to identify a specific static edition. For instance:

`dsi:wk1LzCaCSKkIvLAYObAvaoLNGPc/0.4`

identifies a draft edition 0.4 of this document. This edition 0.4 will never change.

Author-Owned Identifiers

A digital succession is a work by an author, as declared by the author over time. Unlike a traditional journal article, a digital succession is not a single final published result. Unlike preprints on a preprint server, a digital succession is not a sequence of deposits at a specific preprint server. A DSI identifies an author's work independently of where it is stored or viewed.

An author determines the editions in a digital succession by digitally signing the digital succession with an SSH signing key.

Multilevel Edition Numbering

Multilevel numbering is found in the numbering of chapters, sections, and subsections (e.g., chapter 2, section 2.4, subsection 2.4.3) as well as software release versions (e.g., software release 2.19.2). Authors of digital successions can use multilevel numbering to identify editions or stick to simple edition numbers of just positive integers, like textbook editions and preprint version numbers.

Multilevel numbering is particularly useful when amending editions with a binary change in the digital object but not in the intellectual content. The DSI specification does not specify the meaning of different levels in edition numbers, except that larger integers come after smaller integers and higher-level edition numbers identify subordinate sequences of lower-level edition numbers (e.g., the entire sequence of editions numbers 2.1, 2.2, 2.3, … can be identified by edition number 2).

Use of Zeros in Edition Numbers

Zeros are valid at any level in an edition number, except at the end. An edition number with a zero at any level carries special meaning. These editions are *unlisted*, which means they are accessible but should not be listed by default. This is conceptually similar to hidden files in file systems. Authors may choose to use this feature in various ways, such as for editions not intended for the main target audience, testing purposes, drafts, or preliminary releases.

Relationship to Git

While Git is normally used to store a full history of source code revisions, it is not used for that exact purpose with digital successions. Git is used as a pragmatic implementation layer because it can handle distributed data replication, digital signing, and cryptographic hashes. The only history stored in a digital succession is primarily the history of additions of new editions to the succession.

Conclusion

As of late 2023, digital successions have been implemented and used by the author for over a year. Authors interested in publishing digital successions can visit try.perm.pub to get started.

For technical details on how DSIs are implemented, see the Digital Succession Identifier Specification [5] or the software library at gitlab.com/perm.pub/hidos.

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