

Preservation Policy of ZB MED - Information Centre for Life Sciences

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1 Introduction

The German National Library of Medicine (ZB MED) – Information Centre for Life Sciences is an important component of the information and research infrastructure for life sciences in Germany and Europe. As such, the Information Centre performs a key role in providing nationwide access to information and literature. ZB MED is a driving force behind the creation of an interconnected digital ecosystem of knowledge for life sciences. Its mission is to acquire, catalogue, archive and provide access to a broad range of scientific literature and specialist information from the fields of medicine, health, and nutritional, environmental and agricultural sciences, including the relevant basic sciences. ZB MED secures long-term access to this information for its target groups from the realms of life science research, teaching and practice. ZB MED has enacted a digital preservation strategy in order to preserve the digital heritage of the life sciences for the long term – above and beyond the lifespan of specific hardware and software.

ZB MED is a member of the Digital Preservation Network of the German National Subject Libraries (ZFB-NLZA). Together with its partner libraries TIB – Leibniz Information Centre for Science and Technology¹ and ZBW – Leibniz Information Centre for Economics,² ZB MED has established a joint digital preservation system. The consortium has drawn up a Preservation Policy³ in which the three partner organisations commit to ensuring the long-term accessibility of their digital collections and define appropriate guidelines for digital preservation and for the operation of their joint preservation system.

The purpose of this Preservation Policy is to describe the principles and goals of digital preservation pursued by ZB MED as an institution. It is aimed at ZB MED employees and is also intended to provide information to life science data producers and to ZB MED users including students, researchers and those that make use of ZB MED's publishing services. This Policy is regularly reviewed and updated as necessary.

2 Remit

ZB MED – Information Centre for Life Sciences acquires, catalogues, archives and provides access to analogue and digital information media for specific target groups. Its goal is to ensure access to life sciences information and literature in its role as a key component of Germany's research infrastructure. ZB MED's unique collection of life science literature and specialist information provides the foundations for the development of modern, needs-based information services for life scientists from the realms of research, teaching and practice. ZB MED works on behalf of these target groups to aggregate, leverage and link together a heterogeneous mix of scientific data, information and literature, paving the way for new approaches to research. One of ZB MED's key tasks is to make these heterogeneous collections available and accessible to its target groups on a long-term basis. To this end, ZB MED is developing best practices for a digital archive based on the open archival information system (OAIS) outlined in ISO standard 14721.

¹ <https://www.tib.eu/de/>, last accessed on 09 August 2021.

² <https://www.zbw.eu/de/>, last accessed on 09 August 2021.

³ Joint Policy on digital preservation of the Digital Preservation Network of the German National Subject Libraries: <https://www.zbmed.de/en/about/policies/preservation-policy-of-the-three-german-subject-libraries/>, last accessed on 09 August 2021.

3 Target groups

The target groups that make use of ZB MED's digital archive include both the producers and users of life science literature and data. In addition to researchers, teachers and students from national and international universities, these also include members of non-university institutions, in particular of the Leibniz Association.

In addition, the target groups for ZB MED's digital preservation services include the various organisational units of ZB MED which collect and provide access to life science literature and data and develop modern, needs-based publishing and information services for the aforementioned ZB MED target groups – all tasks that are based on securing long-term access to the digital heritage of the life sciences.

The Digital Preservation of ZB MED takes into account what target groups need from a digital preservation system.

4 Collection profile and selection

As a national specialist library, ZB MED's mission is to ensure the nationwide provision of information and literature in the fields of medicine, health care, nutritional, environmental and agricultural sciences – including the relevant basic sciences and related subject areas – for the purposes of research, teaching and practice. ZB MED also collects and archives theses and dissertations submitted to the Medical Faculty of the University of Cologne in its role as the Medical Department of the University and City Library of Cologne. To meet its goals, ZB MED maintains its own extensive collections of life science literature and data in both analogue and digital formats.

Furthermore, ZB MED fulfils its remit as a modern information centre for the life sciences by pursuing the goal of cooperating with partners to supply the scientific community with the literature and information it needs.⁴ For the same purpose, it runs the search portal LIVIVO to provide references and citations to worldwide life science content and compile this into a virtual collection. This mission is reflected in ZB MED's current acquisition profile for its own collections, which focus on closing gaps in available literature in Germany by entering into targeted cooperative ventures and making carefully chosen acquisitions. The library's acquisition policy is based on the needs of its target groups and focuses, in particular, on specific and/or unique life science content. In developing its collections, ZB MED pursues an e-preferred acquisition strategy and increasingly seeks to acquire digital media. In addition to literature, ZB MED is increasingly focusing on collecting research data from the life sciences. Moreover, retrodigitisation procedures make it possible to provide ZB MED users with access to digitised derivatives of the library's analogue holdings. Open-Access-content published via ZB MED's publication services and respective platforms is also part of ZB MED's collection.

⁴ cf. Funding Information Infrastructures for Research. A strategy paper by the German Research Foundation, Bonn, 15 March 2018, http://www.dfg.de/download/pdf/foerderung/programme/lis/dfg_strategy_paper_funding_info_infrastructures_research.pdf, last accessed on 09 August 2021.

5 Principles of digital preservation

As a key part of Germany's national information research infrastructure and a supporter of open access and FAIR data principles, ZB MED is not only responsible for safeguarding access to digital information in a way that reflects users' needs, but also for ensuring the preservation, accessibility and reusability of this digital information over the long term. Digital preservation is one of ZB MED's enduring and core tasks. Embedded within ZB MED's organisational structure as a dedicated department within the general operating area of "Open Science", it is conducted in accordance with the following principles:

5.1 Preservation watch, cooperation and networks

Successful digital preservation requires active engagement with the lifecycle of digital data and a willingness to tackle the challenges involved and to take steps to prevent the loss of information. Accordingly, digital preservation is a process that requires responses to both technological innovations (technology watch) and changes in users' needs (community watch) and to adopt appropriate measures to avoid irretrievable data loss. Potential threats in this context include obsolete file formats, damaged data media and incomplete metadata.

ZB MED keeps up-to-date with the latest developments in this field by maintaining partnerships and cooperative ventures with other heritage institutions that face the same challenges of digital preservation. Together with its partners, ZB MED develops digital preservation standards and best practices. It does this in various ways, for example through its membership in the Digital Preservation Network of the German National Subject Libraries, its involvement in the German and international Rosetta user community, as an active member in nestor⁵ (the German centre of expertise for digital preservation) and in the international Open Preservation Foundation (OPF)⁶.

5.2 Metadata

Metadata plays an important role in preserving data, in keeping it interpretable and retrievable, and in ensuring the authenticity of the information it contains. ZB MED therefore pursues an active metadata management strategy which involves collecting, enriching and processing metadata in all its forms (descriptive, technical, administrative, structural, rights management, process-related, etc.) in addition to preserving the digital objects themselves. ZB MED's digital preservation team ensures that metadata is transferred to the digital preservation system in its entirety and in a standardised format. Once imported, it is then enriched with additional relevant metadata, for example from the Joint Catalogue of the regional libraries. This approach guarantees the long-term interpretability, retrievability and interoperability of the data concerned.

5.3 Conformance with legal requirements

ZB MED acquires digital preservation rights by making corresponding author and licensing agreements with the parties that produced the data. Its digital preservation practices also comply with the requirements of German copyright law (UrhG §§ 44a – 63a).

Managing digital objects in the digital preservation system also requires the processing of personal data. ZB MED maintains a register of its activities related to the processing of personal data.

⁵ <https://www.langzeitarchivierung.de/>, last accessed on 09 August 2021.

⁶ <https://openpreservation.org/>, last accessed on 09 August 2021.

5.4 Preservation level

Digital preservation can be conducted on different levels:

Bitstream preservation ensures bitstream integrity and stability by regularly replacing storage media. This protects against the loss of bits ("bit rot").

Logical preservation ensures long-term availability and machine readability of digital objects. This may be achieved by converting obsolete file formats (migration) or by restoring original system environments (emulation).

Semantic preservation focuses on preserving the long-term interpretability and retrievability of digital objects at the content level by keeping context information (representation information) up-to-date at all times.

ZB MED strives to conduct digital preservation on all three levels: bitstream preservation, logical preservation and semantic preservation. In some cases, however, processing may be impossible for technical and legal reasons – for example with password-protected digital objects such as a password-protected PDF file. In such cases, digital preservation is only conducted at the level of bitstream preservation.

5.5 Maintenance of data integrity

ZB MED's digital preservation system includes measures to safeguard data integrity. Digital objects are protected against unauthorized manipulation by means of checksums, redundant storage, and the timely replacement of obsolete storage media.

5.6 Maintenance of authenticity

To maintain the authenticity of digital objects, the original files are transferred into ZB MED's digital preservation system as archive masters, i.e. completely unmodified. Modifications are only made to representations of the original files (derivatives) and are fully documented in the metadata. This ensures that the authenticity of the original object is maintained and that any changes and digital preservation measures that are carried out can subsequently be traced through the various versions of the derivatives.

5.7 Maintenance of completeness

The content, structure and metadata of digital objects are fully transferred to ZB MED's digital preservation system.

5.8 Maintenance of readability

Even before objects are transferred to the digital preservation system, ZB MED provides recommendations regarding file formats that are suitable for digital preservation for data producers.

This ensures that the optimum conditions are in place for digital preservation and for maintaining the long-term readability of digital resources.

Once digital objects have been transferred to the digital preservation system, ZB MED maintains the readability of the objects by enacting a continuous system of preservation planning and risk

management practices. Should any risk of data loss arise, the obsolete file formats are converted into different file formats as required (data migration).

5.9 Maintenance of retrievability

ZB MED's digital preservation system ensures that its digital objects are uniquely identifiable and retrievable over the long term. This is achieved in two ways: firstly, by archiving persistent identifiers that are assigned on ZB MED's publishing platforms and, secondly, by archiving additional metadata that facilitate searches for digital objects in the digital preservation system.

5.10 Maintenance of confidentiality

As part of its digital preservation strategy, ZB MED employs an active rights management strategy by storing usage and licensing rights and linking them to the corresponding objects. In this way, ZB MED ensures that all the legal time limits and conditions are observed when providing access to digital objects (see 5.12).

5.11 Documenting the processes

It is important that target groups can retrace the digital preservation processes at all times. ZB MED therefore regularly documents the processes associated with digital preservation, such as file format identification processes.

5.12 Access and usage

ZB MED's digital preservation system is operated as a “dark archive” in order to protect it against unauthorised access by third parties. This means that direct access to the system is restricted to specific ZB MED employees entrusted with digital preservation duties.

Digital objects are made available through the respective publishing platforms and ZB MED's search and reference tools. Copies are only exported from the preservation system and forwarded in a timely manner to the respective platform in the event that the digital objects available through these platforms are defective or non-existent.

6 Technical infrastructure

In collaboration with its partners TIB and ZBW, ZB MED's digital preservation system uses a technical infrastructure that has implemented the OAIS functional entities ingest, data management, archival storage, administration, preservation planning and access. In addition, the technical infrastructure processes digital objects as information packages (submission information packages (SIP), archival information packages (AIP) and dissemination information packages (DIP)).

ZB MED is responsible for processing its own digital holdings in the digital preservation system, controlling workflows and preservation measures, and handling quality assurance. The hosting of the data and administration of the digital preservation system is handled by TIB.

7 Responsibilities

The ZB MED operating unit “Open Science” at ZB MED is responsible for creating and updating this Preservation Policy.

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