



Assessment Information

[CoreTrustSeal Requirements 2020–2024](#)

Repository: ZB MED Digital Long-Term Archive
Website: <https://www.zbmed.de/en/>
Certification period: 23 January 2024 - 22 January 2027
Requirements version: CoreTrustSeal Requirements 2020-2022

This repository is owned by: **ZB MED - Information Centre for Life Sciences**

CORE TRUSTWORTHY DATA REPOSITORIES REQUIREMENTS

Background Information

Repository Type

Please provide context for your repository. You can select one or multiple options.

Response:

- Domain or subject-based repository
- National repository system; including governmental

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

Description of Repository

Provide a short overview of the repository.

Response:

The ZB MED Digital Long-Term Archive (Digital Archive) is part of ZB MED – Information Centre for Life Sciences (ZB MED), as the department "Digitale Langzeitarchivierung" (Digital Preservation). It aligns with ZB MED's strategy (1, 2). It intends to preserve ZB MED's holdings.

ZB MED belongs to the German National Subject Libraries which are responsible for the provision of information and literature for their respective subject areas in Germany. ZB MED's responsibility are the fields of medicine, health care, and nutritional, environmental and agricultural sciences, including the relevant basic sciences and related subject areas (3).

ZB MED has been a foundation under public law since 2014 (4). It maintains a strategic alliance with the Bielefeld Institute for Bioinformatics Infrastructure (BIBI) (5), as well as joint projects and collaboration with local institutions of higher education (University of Cologne, University of Bonn, University of Bielefeld and TH Köln – University of Applied Sciences) (6).

ZB MED's holdings consisted 2020 of ca. 2.1 million volumes, among those are 30,000 journal titles. With regard to open access, 5,752 open access journal articles and 83,483 open access conference abstracts have been published on the publication portal German Medical Science (GMS), for which ZB MED provides the editorial office (more on GMS, see below) (7).

Selection and generation of material is determined by ZB MED's services and collection profile (8).

The Digital Archive of ZB MED has the goal to preserve ZB MED's holdings and the selection of material for the archive is conducted accordingly.

Currently, only GMS collections are preserved which are composed of research literature. Accordingly, the Digital Archive contains only GMS collections i. a. research literature. These collections, among them journal articles and conference abstracts (meetings abstracts), are accessible for external users via GMS publication portal (egms portal, 9). They stay accessible there as access copies of the archived objects (for access scenarios and examples, see R 13).

GMS is the publication portal of the Association of the Scientific Medical Societies in Germany (Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften, AWMF). It is run in cooperation with the Federal Institute for Drugs and Medical Devices (Bundesinstitut für Arzneimittel und Medizinprodukte, BfArM) and ZB MED (9). ZB MED provides the editorial office (ZB MED GMS department) for journal articles and conference abstracts, while DIMDI/BfArM edits research reports. This research literature is published via the GMS portal (9). Medical Guidelines are presented on the portal as a separate section but are published in GMS journals. Accordingly, they are not mentioned separately in the following. When new collections are selected for archiving, the Digital Archive establishes specific data transfer workflows and evaluates curation processes.

The Digital Archive of ZB MED is a dark archive which is operated in cooperation with TIB Leibniz Information Centre for Science and Technology University Library (10) and ZBW Leibniz Information Centre for Economics (11) (see also under R 0 Insource/Outsource Partners). Rosetta from ExLibris (12) is used as the preservation software.

In case the original publication is not available anymore on a publication portal, like GMS, the Digital Archive can deliver archival copies to data providers like the GMS editorial office. The editorial office then can make the archival copy available to users via the platform.

Links

(1) ZB MED Preservation Policy, <https://www.zbmed.de/en/about/policies/preservation-policy/>

ZB MED Digital Long-Term Archive

(2) ZB MED/BIBI Strategie 2020-2025

https://www.zbmed.de/fileadmin/user_upload/Profil/PDFs/Strategie_ZBMED_BIBI_2020-2025_eng.pdf

(3) ZB MED Preservation Policy, section 4 <https://www.zbmed.de/en/about/policies/preservation-policy/>

(4) <https://www.zbmed.de/en/about/about-zb-med/history-facts-and-figures/>

(5) ZB MED/BIBI Strategie 2020-2025, p. 13

https://www.zbmed.de/fileadmin/user_upload/Profil/PDFs/Strategie_ZBMED_BIBI_2020-2025_eng.pdf

(6) ZB MED/BIBI Strategie 2020-2025, p. 7, 10

https://www.zbmed.de/fileadmin/user_upload/Profil/PDFs/Strategie_ZBMED_BIBI_2020-2025_eng.pdf

(7) all numbers from 2020, <https://www.zbmed.de/en/about/about-zb-med/history-facts-and-figures/>

(8) <https://www.zbmed.de/en/library/for-libraries/services-and-collection-profile/>

(9) <https://www.egms.de/static/en/about.htm>

(10) Cooperation partner TIB: <https://www.tib.eu/en/>

(11) Cooperation partner ZBW: <https://www.zbw.eu/en/>

(12) <https://knowledge.exlibrisgroup.com/Rosetta>

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

Designated Community

Provide a clear definition of the Designated Community

Response:

The definition of the designated community of ZB MED's Digital Archive is included in the Preservation Policy (1). The designated community is derived from ZB MED's remit and its target groups. ZB MED aims to provide needs-based information services for researchers, scientists with teaching functions and practitioners from the life sciences. As such, its goal is to ensure "access to life science information and literature in its role as a key component of Germany's research infrastructure" (2). Target groups are specifically producers and users of life science literature and data which may be researchers, teachers and students. These may be members of national and international universities but also members of non-university institutions, in particular of the Leibniz Association (1). Since the Digital Archive is a dark archive, the designated community does not have direct access to the archived objects. The Designated Community can directly access respective access copies of the archived objects via the publication portal GMS (3) (see also R 13). Direct interaction of the Digital Archive occurs with departments of ZB MED which collect and provide information services for ZB MED's target groups. If the original is not available anymore via the portal, the Digital Archive provides the GMS editorial office with the archival copy. Accordingly, access is ensured to life science literature, specifically GMS publications, for the life science community. Additionally, the designated community and its habits are observed in the context of community watch by ZB MED departments (see also R 6). Preservation decisions follow developments in the community and technological developments (R 10). In order to preserve usability of publications for users, the Digital Archive intends to conduct preservation measures like migration when necessary (4).

Links

(1) ZB MED Preservation Policy, section 3, <https://www.zbmed.de/ueber-uns/policies/preservation-policy/>

(2) ZB MED Preservation Policy, section 2, <https://www.zbmed.de/ueber-uns/policies/preservation-policy/>

(3) <https://www.egms.de/dynamic/en/index.htm>

(4) <https://www.publisso.de/en/digital-preservation/preservation-planning/>

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

ZB MED Digital Long-Term Archive

Level of Curation

Select all relevant types of curation.

- Content distributed as deposited
- Basic curation – e.g., brief checking, addition of basic metadata or documentation
- Enhanced curation – e.g., conversion to new formats, enhancement of documentation
- Data-level curation – as above, but with additional editing of deposited data for accuracy

Response:

- A. Content distributed as deposited
- B. Basic curation – e.g. brief checking; addition of basic metadata or documentation
- C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

Level of Curation - explanation

Please add the description for your Level(s) of Curation.

Response:

The objects are transferred to the archive as-is. If preservation measures need to be conducted on objects in the Digital Archive, a new version of the object is generated by the employees of the Digital Archive (R 7, R 10). Accordingly, the Digital Archive can provide the original ingested version and the preserved version. Validation checks are conducted during ingest via the Digital Archive, e. g. validation with JHOVE (1) (R 7). Descriptive metadata are documented by librarians and the editorial team of GMS, both situated at ZB MED. During ingest, metadata are enriched by the Digital Preservation team of the Digital Archive and by the archival software with regard to descriptive, technical, structural and rights metadata (see also R 8 and R 11) (2). In case preservation actions become necessary, the Digital Archive can use the preservation module of the digital preservation software to conduct these and the actions are documented automatically by the software (R 10) (3). The three levels of curation will also be the aim when setting up archiving of a new collection.

Links

(1) <https://openpreservation.org/tools/>

(2) <https://www.publisso.de/en/digital-preservation/dp-metadata/>

(3) <https://www.publisso.de/en/digital-preservation/preservation-planning/>

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

Insource/Outsource Partners

If applicable, please list them.

Response:

ZB MED Digital Long-Term Archive

For digital preservation, ZB MED cooperates with two other German National Subject Libraries:

- TIB Leibniz Information Centre for Science and Technology University Library (TIB) in Hannover (1) and
- ZBW Leibniz Information Centre for Economics (2) in Hamburg and Kiel, Germany.

The cooperation of the three libraries is specified in a cooperation agreement (confidential) and in a joint preservation policy (3) which sets the frame for individual preservation policies of the mentioned libraries. The cooperation is called Digital Preservation Network of the German National Subject Libraries.

The system and software which provide the backbone of the Digital Archive is the Rosetta System developed by Ex Libris.

TIB has licenced the Rosetta software, maintains the system infrastructure and acts as a host for the digital archives of ZB MED and ZBW. Both ZB MED and ZBW hold sub-licenses for Rosetta. The digital archives of TIB and ZBW have also been certified, as they received the Data Seal of Approval (both 2017) and the Core Trust Seal (ZBW 2019, TIB 2020) (4), as well as the nestor seal (both 2017) (5).

TIB is also responsible for the system administration and maintains the computing centre necessary for hosting Rosetta.

All digital objects and the corresponding metadata are stored in this computing centre. TIB, ZB MED and the ZBW each have separate areas within the preservation system with separate institutional configurations. They are free to ingest their own digital material into this system, generate their own workflows and remain responsible for their own material. Access to material in each system area is only granted to members of the respective institution.

The cooperation agreement and a contract for the sub-licensing for Rosetta include service level and support agreements.

These certification requirements of the CoreTrustSeal are affected by cooperation with TIB:

- R9 Documented storage procedures
- R15 Technical Infrastructure
- R16 Security

Documentation and services of the software provider Ex Libris are freely available online (6).

Within ZB MED, IT-Infrastructure used by the Digital Archive is maintained by the IT department. Digital objects delivery to the Digital Archive and user access to objects via the publication platform is the responsibility of the departments at ZB MED that are managing and publishing the respective collections. In this case the relevant department is the GMS department with the GMS editorial office.

For preparation of a subset of the GMS collection for submission to Rosetta, software development firm Rheinware GmbH (7) was contracted. Object packages were prepared by Rheinware according to specifications from the Digital Archive at ZB MED and from GMS department. Results were reviewed for quality by both departments and provenience of data was documented accordingly with the objects. Subsequent ingest of the objects prepared by Rheinware was conducted by the Digital Preservation team at ZB MED.

Links

(1) Cooperation partner TIB: <https://www.tib.eu/en/>

(2) Cooperation partner ZBW: <https://www.zbw.eu/en/>

(3) Preservation Policy of the German National Specialist Libraries:

<https://www.zbmed.de/en/about/policies/preservation-policy-of-the-three-german-subject-libraries/>

(4) TIB certification: <https://www.tib.eu/en/publishing-archiving/digital-preservation>, ZBW certification:

<https://www.zbw.eu/en/about-us/key-activities/digital-preservation>

(5) https://www.langzeitarchivierung.de/Webs/nestor/EN/Zertifizierung/nestor_Siegel/siegel.html

(6) <https://knowledge.exlibrisgroup.com/Rosetta>

(7) Rheinware GmbH <http://www.rheinware.de/>, in German only

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

Significant Changes

Summary of Significant Changes Since Last Application if applicable.

Response:

-

Reviews

Reviewer 1:

ZB MED Digital Long-Term Archive

Comments:

Reviewer 2:

Comments:

Other Relevant Information

You may provide other relevant information that is not covered by the requirements.

Response:

Digital dark archive.

Amount of digital objects archived:

In August 2021, 64,240 digital intellectual entities were present in the Digital Archive of ZB MED.

Role of the Digital Archive and networking:

ZB MED has a national responsibility towards provision of scientific information within life sciences, which translates to the Digital Archive.

ZB MED and its cooperation partners are members of

- nestor – the network of expertise in long-term storage of digital resources in Germany (1)
- the Open Preservation Foundation (2)
- the German-speaking and international Rosetta user community (3)

Information exchange and active participation is detailed in R 6.

Links

(1) https://www.langzeitarchivierung.de/Webs/nestor/EN/Home/home_node.html

(2) <http://openpreservation.org/>

(3) <https://igelu.org/products-and-initiatives/product-working-groups/rosetta/>

Reviews

Reviewer 1:

Comments:

Accept

Reviewer 2:

Comments:

Organizational Infrastructure

R1 Mission/Scope

The repository has an explicit mission to provide access to and preserve data in its domain.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

ZB MED is responsible for the preservation of digital documents and objects of its own collections due to its mandate for providing "reliable, long-term access to information, literature and data" (1) in the fields of life science (1). Long-term availability of its holdings is one of the library's central tasks as a German National Subject Library, also detailed in § 2 of its Foundation Statutes: the institution has the task of target group-specific acquisition, cataloguing, archiving and deployment of literature (2).

ZB MED references this task in its institutional strategy as the institution's aim of providing information in the context of digital transformation (3).

According to this strategy, ZB MED's responsibilities are sustainable access to information, research literature and data in life science (3) and securing trans-regional literature and information availability (4). The ZB MED Digital Archive transfers only research literature of the GMS portal into the archive at the moment.

Tasks with regard to digital preservation are further defined in ZB MED's Preservation Policy. "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

ZB MED Digital Long-Term Archive

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.” (5)

For preservation of archived content ZB MED provides a preservation management concept (6), based on its preservation policy. Currently, this is applied to only research literature.

Links:

- [\(1\)](#)
- [\(2\) Foundation Statutes, in German only](#)
- [\(3\) ZB MED/BIBI Strategy 2020-2025, page 3](#)
- [\(4\) ZB MED/BIBI Strategy 2020-2025, page 9](#)
- [\(5\) ZB MED Preservation Policy, section 1](#)
- [\(6\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R2 Licenses

The repository maintains all applicable licenses covering data access and use and monitors compliance.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

ZB MED facilitates publication of research literature (journal articles, conference abstracts, research reports and guidelines) via the German Medical Science (GMS) platform (1). Digital preservation of these objects occurs in the ZB MED Digital Archive, which functions as a dark archive. Accordingly, direct access to archived objects is granted only to staff of the Digital Preservation department of ZB MED.

The GMS platform hosts research literature, such as the aforementioned journal articles. ZB MED provides an editorial team for publications on the GMS platform, which ensures formal integrity of publication. Editors of specific articles observe quality assurance with regard to content of these publications. The authors, and in general third parties, submitting publications to GMS, are required to sign the author's contract upon submitting the manuscript. The contract is accessible on the webpage (2). Per author's contract, authors grant permission for ZB MED to store (§ 2, (2)), copy (§ 2, (5)), process and grant public access to the publications by way of GMS portal (§ 2, (2)). Permission for long-term preservation is requested under § 2, (5) and allows the conversion to different electronic or physical formats for archiving purposes.

All content published in the GMS portal is in general published under an Open Access License, specified as Creative Commons Licenses (see §5, (3) author's contract (2)). The respective license is declared in each article (3). Access is unrestricted and open to the public via internet. Regarding text or figures with third party copyrights, responsibility lies with the author to clarify legal issues, as per § 1, (2) (author's contract, (2)). Creative Commons Licenses are documented within the preservation system Rosetta alongside the respective objects.

Since literature and articles are freely accessible on the GMS platform, ZB MED has no influence on whether users comply with legal restrictions. Term and conditions for use of the GMS portal allow for anyone to “read, download, copy, distribute, print, search in, refer to and use the full-texts in any other conceivable legal way as well, without financial, legal or technical barriers except for those that are linked with internet access itself. The only existing restriction in connection with reprinting and distribution is the protection of the author's right of accurate citation” (4).

Data protection of cooperation partners, users and authors is detailed in R 4.

ZB MED Digital Long-Term Archive

Links:

- [\(2\)](#)
- [\(3\) exemplary article, license is mentioned at the end](#)
- [\(4\)](#)
- [\(1\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R3 Continuity of access

The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

Compliance level:

The repository is in the implementation phase - 3

Response:

The principle behind long-term preservation aims at availability of archived objects for an indefinite timespan. Accordingly, ZB MED ensures long-term availability and usability of research literature according to the requirements of pre-determined target groups (see also R 1). In order to support mainly research but also additional endowers using ZB MED provided content, objects have to be provided in contemporary, non-obsolete file formats (1). This includes research data in the future, which is not archived in ZB MED Digital Archive at the moment. Furthermore, content in the archive has to be findable, as well as readable and accessible for ZB MED employees. They are responsible for the substitution process of objects in case an access copy of a user-accessible ZB MED service, like the GMS publication portal, has to be substituted with an archival copy. These conditions for content in the archive are met by providing objects with sufficient metadata when transferring them into the archive (2, R 13 and R 14)) and managing them in the digital preservation system. For preservation of objects in contemporary file formats, the Digital Preservation team is relying on Rosetta implemented preservation planning (3, see also R 10) and is taking object reuse scenarios into consideration (R 14).

In case an exit scenario demands export of archived objects, this function is provided by the software (4), generating packages of the objects and relevant metadata that can be reused in software-dependent und software-independent environments.

The Digital Preservation department is permanently integrated into ZB MED and can therefore continuously provide its holdings. Its funding is stable, with several permanent employees, a financial plan and a budget (see also R 5).

ZB MED Digital Preservation will analyse risk scenarios in the next three years and develop continuity plans as necessary.

TIB as the hosting and administrating institution for the technical infrastructure (see also R 0) has also prepared for various scenarios (crisis situations), therefore providing technical and infrastructural security (5).

ZB MED itself is a foundation under public law of the Federal State of North-Rhine Westphalia. It is currently funded by the Ministry of Innovation, Science and Research of the State of North Rhine-Westphalia and the Federal Ministry of Health (see also R 5). According to its Foundation Statutes, ZB MED is a provider of national importance for research and educational literature regarding the fields of medicine, health, and nutritional, environmental and agricultural sciences, including the relevant basic sciences and peripheral subject areas (Foundation Statutes § 2) (6). Digital preservation is a central service in fulfilling this legal mandate (7). While ZB MED's Digital Archive currently archives only publications on the GMS publication portal (8), it will establish archival workflows for further collections of ZB MED. The Digital Archive is responsible for preservation of ZB MED's holdings. In case ZB MED permanently ceases its capacity as an institution, its assets including archived objects fall to the state of North-Rhine Westphalia (§ 3, (2) Foundation Statutes).

Links:

ZB MED Digital Long-Term Archive

- [\(2\)](#)
- [\(3\)](#)
- [\(4\)](#)
- [\(1\) preferred file formats for publications at ZB MED](#)
- [\(5\) TIB CTS 2020, R3](#)
- [\(6\) Foundation Statutes, only in German](#)
- [\(7\) ZB MED/BIBI Strategy 2020-2025, page 9](#)
- [\(8\)](#)

Reviews

Reviewer 1:

Compliance level:

The repository is in the implementation phase - 3

Comments:

Accept

Reviewer 2:

Compliance level:

The repository is in the implementation phase - 3

Comments:

R4 Confidentiality/Ethics

The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

The ZB MED Digital Archive complies with the regulatory norms in German Law. Concerning data protection and copyright, it especially acts in due diligence according to the General Data Protection Regulation, Data Protection Act of North Rhine Westphalia and the personal rights of people affected in the archiving process. With regard to Copyright, the archive conforms to the German Copyright Act. Related measures taken by ZB MED are described in R 2 Licences.

The archive is a dark archive, which allows only Digital Preservation department staff to directly access archived objects.

The detailed role management of Rosetta allows access restrictions according to Rosetta user details. It protects objects from unintended access, manipulations or changes. Personal data of employees is recorded in the internal system of Rosetta and only visible to users with user manager roles. Otherwise users are represented by a given username.

Regarding data protection and personal rights, ZB MED, its services, platforms and its Digital Archive protect the data of its cooperation partners, of users of ZB MED services, as well as personality rights of authors and other individuals mentioned in published objects deposited in the Digital Archive. It follows the provisions of the "General Data Protection Regulation" and the "Data Protection Act North Rhine-Westphalia" (1.1 and 1.2).

ZB MED provides its services per public mandate, the legal mandate is determined in ZB MED's Foundation Act, § 2, (1) (see 2). ZB MED also has appointed a data protection officer (see 3) who monitors the observation of data protection specifications. All users of ZB MED's platforms can access the applicable usage regulations on the relevant website (4).

The data ZB MED processes and stores in its long-term archive are not confidential, as it is only personal data which have been published by the author beforehand and which is publicly available. These objects contain scientific topics without including personal or confidential data as relevant to the German data protection legislation.

Additionally, ZB MED employees are obligated to confidentiality as civil servants, according to contract details. This is stated in § 3, (2) TV-L (5), the labour act for civil servants in Germany, detailing pay, obligations and rules of conduct.

Hosting of the archive is a service of TIB. The system is client compatible, allowing the three German National Subject Libraries, TIB in Hannover, ZBW in Kiel und ZB MED in Köln, to operate their archives separately. Employees of each library may only access their own archived objects. Administration rights lie with TIB, as is determined by the Consortium Agreement (confidential).

ZB MED Digital Long-Term Archive

Links:

- [\(1.1\) General Data Protection Regulation](#)
- [\(1.2\) Data Protection Act North Rhine-Westphalia \(Datenschutzgesetz Nordrhein-Westfalen\), in German only](#)
- [\(2\) Foundation Act, in German only](#)
- [\(3\)](#)
- [\(4\)](#)
- [\(5\) TVL \(labour act for civil servants in Germany\), in German only](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R5 Organizational infrastructure

The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

Organisational structure

ZB MED, as the German National Subject library for providing and consequently preserving life science literature as well as information and data in Germany, has tasks of national significance. Accordingly, the Digital Archive at ZB MED is structurally embedded in the organizational structure of ZB MED. The Digital Archive is a permanent organizational unit as part of the Open Science program area (1) and is represented by the Digital Preservation department. This department maintains the ZB MED's Digital Archive and is responsible for conducting all tasks relevant for digital preservation, like ingest into the archive, preservation actions and export.

Funding

ZB MED is presently funded by the Ministry of Innovation, Science and Research of the state of North Rhine-Westphalia and the Federal Ministry of Health (2). Furthermore, ZB MED also successfully applies for third-party funds.

Budget planning of ZB MED is conducted via a yearly Program Budget with tasks, aims, derived measures as well as results. The Program Budget is based on the Leibniz Association's financial planning specifications (3). The ZB MED Program Budget contains information about organizational units, including the Digital Preservation department, and resources relevant for reaching the stated aims. The budget is determined based on cost and activity accounting and the budget plan is prepared two years in advance.

For the Digital Preservation department, and therefore for the Digital Archive, a general budget plan and a concept for finances exist, regarding aspects such as labour cost for Digital Preservation staff or costs for network memberships.

Finances and budget planning regarding non-regular expenses of the Digital Archive are subject to the Digital Preservation department's aims and tasks. The Digital Preservation department's finances are a consistent part of the institution's financial planning and financial needs of the Digital Archive have been met. Due to cooperation with ZBW and TIB, ZB MED was also able to benefit from synergy effects with regard to aspects such as shared licencing costs for the digital preservation system and its maintenance, as well as its hosting at an established central computing centre.

Personnel

The Digital Preservation department, and consequently the Digital Archive, is staffed sufficiently with 5.08 full time equivalents and consists of six staff members, of which three are permanent (September 2021). All of these are involved in management and operation of the archive. Professional

ZB MED Digital Long-Term Archive

background of personnel is library science or computer science. Specifically, one staff member is a software developer.

Training opportunities and networking is available to staff, supported by sufficient finances and a human resource development plan. These include in-house sessions, external professional training and conference participation. ZB MED supports plans of personnel development of its employees. Line managers review individual professional development with staff members once a year. For further topics regarding personnel, the HR Development staff unit as the in-house contact is available.

Furthermore, members of the Digital Preservation team network by attending and contributing in meetings with cooperation partners, as well as international conferences in the digital preservation sector (see also R 6). These attendances result in an exchange of ideas and best practices with regard to digital preservation. On IT-topics the Digital Preservation team is also in regular dialogue with TIB and ZBW and exchanges ideas with other experts at international conferences as well.

Links:

- [\(1\) ZB MED organizational chart, in German only, Digital Preservation as Digitale Langzeitarchivierung](#)
- [\(2\) ZB MED/BIBI Strategy 2020-2025, p. 5](#)
- [\(3\) Leibniz Association's financial planning specifications \("Beschlüsse zur Umsetzung der AV-WGL" WGL-Beschlüsse\), p. 5-6, in German only](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R6 Expert guidance

The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either in-house, or external, including scientific guidance, if relevant).

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

ZB MED – Information Centre for Life Sciences, as the institution the archive is part of, receives scientific guidance from the ZB MED Scientific Advisory Council (Wissenschaftlicher Beirat ZB MED (1)), as detailed in the Foundation Statutes (§ 11 and § 12) (2).

The ZB MED Digital Archive is well integrated into an extensive network of specialists and specialist institutions with regard to digital preservation.

Expert feedback is available from various communities of which ZB MED is a member (3). Workflows and preservation decisions are discussed in depth primarily within three groups ZB MED is a member of:

- Digital Preservation Network of the German National Subject Libraries

- Meetings between the practitioners of digital preservation teams from the three German National Subject Libraries are conducted every six weeks. The participating experts have various backgrounds, like information scientists, software developers, system administrator, librarians, and librarian scientists. In these meetings, workflows and developments at each library are discussed and members exchange detailed advice.

- Further information exchange and networking is conducted during daily work via various methods like shared Wiki and ticket system. Accordingly, feedback from experts outside ZB MED's own system is available.

- In an annual meeting, all people involved in digital preservation at the German National Subject Libraries come together

- for a day in order to discuss new workflows, discoveries and general strategies of the last year as well as for the upcoming year.

- DRAG (Deutsche Rosetta Anwendergruppe, German-speaking Rosetta user group)

- Members of DRAG meet once a year for a two-day conference, hosted by one of the German-speaking institutions using Rosetta. Strategies for the future are presented and coordinated, challenges and possible solutions are discussed in a group of about 30 experts in digital preservation and Rosetta.

ZB MED Digital Long-Term Archive

Expertise in the group is diversified by various backgrounds of members.

- RUG (Rosetta User Group)

• Similarly, international exchange of expertise regarding digital preservation and Rosetta functionality is facilitated via RUG, as it is the international Rosetta User Group. This constellation of Rosetta users also meets once a year for a three-day conference, consisting of 30 people and above.

Besides these networks of knowledge exchange, ZB MED is also a member of nestor, the network of expertise in long-term storage of digital resources in Germany (4) and the international Open Preservation Foundation (OPF) (5).

With regard to nestor, Digital Preservation members of ZB MED participate in regular coordination meetings and steering committee meetings. nestor increases coordination of digital preservation efforts in Germany and actively works in digital preservation awareness and training. Accordingly, ZB MED participates, for several years already, in three of nestor's topic-specific working groups: SIP Concretization, Format Identification and Documentation in Digital Preservation.

OPF membership of ZB MED (5) allows for pooling of technical expertise, supports international knowledge exchange and joint development of technical solutions to digital preservation challenges.

Further awareness of new challenges in the digital preservation sector is maintained by attending conferences regarding digital preservation and user community-specific conferences (see also R 5)

ZB MED in general also participates in workshops of communities which are active in life sciences (6) and organizes expert workshops for a variety of topics (7.1, 7.2), for example in the context of consortia of the national research data infrastructure (8.1, 8.2). Therefore, close contact with ZB MED's user community, scientists of life sciences, is maintained.

Accordingly, any changes in preferred formats will be noticed in a timely manner and translated into processes at ZB MED and at the archive specifically.

Participation in these national and international networks guarantees awareness of new developments in technology, as well as in the scientific communities and regarding general users, who are using library resources. Due to employees' awareness of new developments and established best practices, ZB MED will make sound decisions with regard to digital preservation and challenges can be addressed in a timely and optimal manner.

Finally, maintainers of the German Medical Science platform at ZB MED provide the Digital Archive with objects for preservation. Accordingly, they are the direct user group of the digital archive at ZB MED. Close contact to the GMS department at ZB MED is established via regular meetings. The GMS department maintains close contact to the designated user community of the GMS platform by participating in workshops and conferences of the respective specialist society (9).

Links:

- [\(2\) Foundation Statutes, in German only](#)
- [\(3\)](#)
- [\(4\)](#)
- [\(5\)](#)
- [\(1\) Scientific Advisory Council \(Wissenschaftlicher Beirat\), in German only](#)
- [\(6\) Journal Management Workshop, in German only. Example for participation of ZB MED in a workshop for the potential user community of GMS](#)
- [\(7.1\)](#)
- [\(7.2\) Example for an event on Digital Preservation](#)
- [\(8.1\) Example for workshop with the life science community](#)
- [\(8.2\) Examples for workshops with the life science community](#)
- [\(9\) AWMF-ZB MED cooperation, in German only. Description of a cooperation between ZB MED and Association of the Scientific Medical Societies in Germany \(AWMF\) with regard to GMS on p. 34.](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

ZB MED Digital Long-Term Archive

Digital Object Management

R7 Data integrity and authenticity

The repository guarantees the integrity and authenticity of the data.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

Only staff of the Digital Preservation department, therefore of the Digital Archive, has direct access to the ZB MED Digital Archive; researchers cannot upload content themselves. During content publication – for example when content from producers is submitted to the research literature publishing platform GMS – the GMS department as the department responsible for that publication portal ensures the completeness, authenticity and integrity of the material to be published. DIMDI/BfArM edits research reports. Material from the publication portal GMS is deposited to the Digital Archive.

From this point onwards, ZB MED's Digital Archive is responsible for the integrity and authenticity of objects ingested from the publishing platform. This requires two things to be verified: firstly, that the object is complete and unchanged (integrity) and, secondly, that it is what it claims to be and corresponds to the original when rendered (authenticity). This responsibility applies to the ingest process itself, the period for which objects are held in the digital preservation system, and the process of exporting objects from the digital preservation system (1).

The ZB MED archive accepts all formats (2) from data providers like the GMS publication portal. Still, ZB MED provides a list with preferred formats for researchers (3) which also adheres to Digital Preservation best practices. The format recommendations apply to research literature of GMS, as well as any research object not currently archived.

Data integrity

Three checksums are used to verify and confirm the technical integrity of files within the Rosetta digital preservation system: SHA1 (4), MD5 (5), and CRC32 (6). Checksums are generated by Rosetta during ingest and written to the administrative metadata in the METS file, which is archived in Rosetta together with the object. If any irregularities are detected, ingest of the unit is halted; a staff member will then, after investigation, restart the process to ensure conflict-free ingest of the object into Rosetta. Within the digital preservation system, Rosetta offers the ability to initiate internal processes to verify checksums. These verification processes can run through the whole collection on a regular basis.

As well as checksum processes, Rosetta also performs other quality checks during ingest (7):

- Format identification using DROID
- Format validation using JHOVE
- Virus check
- Extraction of technical metadata using JHOVE
- Validation of the METS file

To ensure the integrity of the data packages delivered to the Digital Archive, the system ingests the complete content, structure and metadata without making any changes (8). The subset of data packages prepared for ingest by Rheinware (see also R 0) were spot-checked by the Digital Archive. When they are imported into the digital preservation system, these data packages are referred to as Submission Information Packages (SIPs); enriched with additional metadata, they become Archival Information Packages (AIPs, 9). The relationship between multiple files within a SIP is recorded in the METS structural map metadata (10).

Rosetta allows archive packages to be exported as DIPs (Dissemination Information Packages) (9). These contain objects and metadata with information about any changes (provenance metadata). Whenever a DIP is created, checksums are generated again and compared to the existing ones.

To maintain the IT infrastructure of the digital preservation system, TIB – which provides and administrates the Rosetta system and infrastructure as a service for ZBW and ZB MED – also ensures data integrity by means of checksums. These are generated for storage system blocks and verified each time data are accessed or transferred (11). In the event of discrepancies, the information can be restored through redundant storage. See R 15 for more information.

Rosetta itself conforms to the Open Archival Information System (OAIS) standard (12).

Authenticity

In order to preserve the authenticity of digital resources, the original files are transferred unchanged to Rosetta as a preservation master. Defining the files as a preservation master ensures the original remains unambiguous within Rosetta.

Changes are only made to copies (derivatives) of the original files (1, 13), thus ensuring the authenticity of the original resource is maintained.

Significant properties for formats are stored in the Format Library, a Rosetta module that is further developed by the Digital Preservation Working Group (DPWG). The DPWG is staffed by members of institutions that use Rosetta. Technical metadata are extracted from files when the files are transferred to the Rosetta system accordingly.

When DIPs are exported and returned to the publication portal GMS, they may contain the original and the eventual copy to which changes have been made, as well as provenance metadata.

Versioning

Changes and digital preservation actions are only carried out on copies of the original (13) and can always be traced back through the various versions of the copies of the original. All changes must be authorised by Digital Archive staff members; every change includes automatic verification of the checksums. During this process, other users are prevented from accessing the AIP in order to avoid conflicts. Every change within Rosetta is automatically recorded in the AIP's metadata as provenance metadata (14) and stored together with the copy. The metadata are supported by the

ZB MED Digital Long-Term Archive

Rosetta

AIP data model, which is based on the widely used PREMIS metadata standard (15). In accordance with the PREMIS model, provenance metadata are stored as event metadata (16).

Links:

- [\(1\) ZB MED Preservation Policy, section 5.5 und 5.6](#)
- [\(2\) "Transfer to the digital archive"](#)
- [\(3\)](#)
- [\(4\) SHA1](#)
- [\(5\) MD5](#)
- [\(6\) CRC32](#)
- [\(7\) Analogous to ingest processes at the cooperation partner TIB](#)
- [\(8\) ZB MED Preservation Policy, section 5.6 and 5.7](#)
- [\(9\) Rosetta AIP Data Model, p. 7](#)
- [\(10\) Rosetta AIP Data Model, p 16-17](#)
- [\(11\)](#)
- [\(12\) Rosetta AIP Data Model, p. 6](#)
- [\(13\)](#)
- [\(14\) Rosetta AIP Data Model, p. 18](#)
- [\(15\) Rosetta AIP Data Model, p. 44](#)
- [\(16\) Rosetta Configuration Guide, Appendix C, Events, Table 29, p. 257-269](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R8 Appraisal

The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

ZB MED intends to transfer its holdings in the fields of medicine, public health, nutrition, and environmental and agricultural sciences – as well as its holdings in the relevant basic sciences and related subject areas – to its digital preservation system. These holdings include research literature publications from German Medical Science (GMS) (1), which is the portal of Association of the Scientific Medical Societies in Germany (AWMF). The GMS portal is run as a cooperative project, in cooperation with ZB MED and BfArM. At the moment, only research literature published via GMS platform is archived in ZB MED Digital Archive.

GMS offers comprehensive publishing services for research literature (journal articles, conference abstracts and research reports) under the gold open access model, which makes the final version of an article freely and permanently accessible for everyone immediately after publication (2). Responsibility for selecting which content to publish on the GMS portal and for performing quality assurance during this selection process lies with the editors or, more

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generally, with the scientific societies (3) that publish the journals and conference publications. For research reports DIMID/BfArM is responsible and edits these before publication. The quality of the content is also enhanced through peer review of publications submitted to the GMS portal. The portal is geared towards medical content (4) and complements ZB MED's collection profile. It thus meets the selection criteria for digital preservation (5).

The descriptive metadata that must be provided is stipulated in requirements that authors must agree to when publishing their work. The minimum requirements for publication via GMS portal are the author's details (first name, surname, institution, address) and the title of the publication.

The editors and the GMS editorial team at ZB MED have defined specific formats in which items are to be published. The publishing workflow ensures compliance with these formats.

Prior to publication, each journal article and conference abstract is approved by the author(s) and the editor.

ZB MED has formulated a list of preferred formats that are suitable for digital preservation of all research literature publications (6) and that also correspond to GMS publishing formats. The originals to be digitally preserved are determined by those responsible for the collection (GMS editorial team at ZB MED) in consultation with the Digital Preservation department. They are then archived accordingly as originals by the Digital Preservation team. Individual publications from the GMS portal are transferred to the Digital Archive as intellectual entities (IEs) without any other limitations.

ZB MED has stipulated preferred and necessary metadata for digital preservation (7) which corresponds to the metadata of GMS publications. The metadata are entered in the publications' XML files by the GMS editorial team at ZB MED; a quality check is carried out during this process. This metadata are made available through an OAI interface in the GMS portal using the Dublin Core standard and are collected by the Digital Preservation department. Via GMS published research literature are catalogued in the regional library catalogue by ZB MED librarians; the catalogue's SRU interface is used for metadata enrichment by ZB MED's Digital Archive. The metadata from this catalogue are mapped to Dublin Core by the Digital Preservation team. Metadata are written to a METS XML file contained in the Submission Information Package (SIP). This file is validated by Rosetta during ingest. Any error messages that occur are evaluated by the Digital Preservation team. Further information on metadata can be found in R 11.

Removing content

Published content may be retracted, in which case it will be removed from the GMS portal. The metadata will remain accessible through the portal, however, thereby ensuring that all references are traceable (8). Originals that are to be archived will not be removed after transfer into the archive.

Retracted content is documented as such in the digital archive.

Relevance of the content for the designated community

Those responsible for the GMS collection at ZB MED maintain contact with academic users of GMS publications in order to respond to their needs. This optimises the publishing process and ensures the best possible reusability of publications for the designated community (see also R6 and R11).

Links:

- [\(3\) GMS Policy, see 5. Publication types and user groups](#)
- [\(5\) ZB MED Preservation Policy, section 4](#)
- [\(4\)](#)
- [\(6\)](#)
- [\(7\)](#)
- [\(8\) GMS Policy, see 3. Technical maintenance, long-term availability and security](#)
- [\(1\)](#)
- [\(2\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R9 Documented storage procedures

The repository applies documented processes and procedures in managing archival storage of the data.

ZB MED Digital Long-Term Archive

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

The Digital Archive at ZB MED uses the shared digital preservation system Rosetta of the three German National Subject Libraries (TIB, ZBW, ZB MED). TIB hosts and administrates the system, with hosting and administration of the archival storage in a dedicated TIB data centre.

Rosetta integrates the OAIS standard in its software structure. Regarding the system structure, the documentation of archival storage is realised by TIB with regard to data centre (1), storage sections and areas (2), integrity assurance and integrity checks (3).

Since the three German National Subject Libraries each have separate storage areas within the system, they are responsible for managing their own objects (2). Preservation actions beyond storage processes as implemented by ZB MED are described in R 10. For more information regarding technical infrastructure, see R 15 and R 16.

Links:

- [\(3\)](#)
- [\(1\)](#)
- [\(2\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R10 Preservation plan

The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Compliance level:

The repository is in the implementation phase - 3

Response:

The Digital Preservation department is responsible for preserving digital objects that are ingested into the digital archive (1).

The objects that are transferred to the Digital Archive are checked during the publication process for readability and completeness by the teams responsible for the respective collection, which is the GMS editorial team at the moment.

During the ingest of objects into the digital preservation system, Rosetta carries out format validation using the JHOVE plug-in and format identification using the DROID plug-in, as well as a virus check. JHOVE is also used to extract technical metadata. Furthermore, three checksums are created for each object. The results of these tests and data extractions are documented by Rosetta in the object's metadata.

Preservation planning at ZB MED (2) is conducted on the following basis: formal quality control by the teams responsible for the collections, as well as format validation, format identification and extraction of technical metadata via the Digital Archive, information in the Format Library of Rosetta, and finally the ZB MED Preservation Policy (3) and the joint preservation policy drawn up in collaboration with its partners TIB and ZBW (4).

The Rosetta digital preservation system has a preservation planning module (5). This module includes a Format Library with defined significant properties and sub-modules with mechanisms for risk analyses and for evaluating results of those, as well as mechanisms for implementing preservation actions.

In Rosetta, the risk analysis process allows risks to be defined individually for each indicator, such as for the impending obsolescence of a file format.

Objects subject to a risk can be identified based on a risk analysis and combined into sets of objects. Preservation plans can then be created for each set

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of objects. These plans allows preservation actions such as migration to be configured and tested for sets by the Digital Preservation team. Based on the significant properties to be preserved for specific formats, the results of the preservation plan test can be analysed and preservation actions can be selected accordingly by members of the Digital Preservation team (5).

Significant properties for formats are defined in the Format Library within Rosetta. The Format Library is a user-driven global knowledge base regarding formats for Rosetta users. It features a list, based on the PRONOM registry (6.1, 6.2), containing relevant information on various formats and the required rendering software. The Format Library is subject to ongoing development by the Rosetta Digital Preservation Working Group (DPWG) (7), which consists of preservation managers who work with Rosetta at institutions around the world. Additionally to the format-specific significant properties available to all Rosetta users, the digital Preservation staff at ZB MED can also define technical and organisational significant properties for specific object groups in Rosetta.

As well as ongoing preservation actions for bitstream preservation, ZB MED employs migration as its preferred preservation strategy to ensure objects can be used over the long term (1). Rosetta allows integration of further tools for additional preservation actions as plugins. Preservation actions are carried out in agreement with those responsible for the collections, like the GMS editorial team; these agreements are documented. When a preservation action is performed by the Digital Preservation team, a new version of the AIP (Archival Information Package) is produced by Rosetta and the original is kept unchanged (2). In cases where the right to migrate files is missing or the files are in proprietary formats, the digital archive only offers bitstream preservation (8). In the case of the archived GMS collection, the digital preservation rights are granted through its publication as open-access content with Creative Commons licences as well as by the author's contract (9, see also R 2).

In Rosetta, each preservation plan and each preservation action is documented by the software (see R 11 for the metadata standards used).

Currently, the formats in the Digital Archive are still up-to-date and sufficient software is available to render the content; therefore, so far it has not been necessary to perform preservation actions. Preservation Planning will be tested in the next three years.

To keep abreast of technological developments and identify the need for preservation actions in the event of impending obsolescence, ZB MED's Digital Preservation department operates a preservation watch system (2).

This includes membership of national and international networks in the specialist digital preservation community, which enables the department to stay on top of best practices and technical changes (10).

Links:

- [\(1\) ZB MED Preservation Policy, section 5.5 – 5.9 and section 6](#)
- [\(2\)](#)
- [\(3\) ZB MED Preservation Policy](#)
- [\(4\) Preservation Policy of the three German National Subject Libraries](#)
- [\(5\) Rosetta Preservation Guide](#)
- [\(6.1\) PRONOM](#)
- [\(6.2\) Rosetta Preservation Guide, p. 21](#)
- [\(7\)](#)
- [\(8\) ZB MED Preservation Policy, section 5.4](#)
- [\(9\)](#)
- [\(10\)](#)

Reviews

Reviewer 1:

Compliance level:

The repository is in the implementation phase - 3

Comments:

Accept

Reviewer 2:

Compliance level:

The repository is in the implementation phase - 3

Comments:

R11 Data quality

ZB MED Digital Long-Term Archive

The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality- related evaluations.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

ZB MED's Digital Archive receives collections of objects and descriptive metadata from data providers who are themselves part of ZB MED. As it only archives research literature of the GMS portal at the moment, the data providers are those who are responsible for the publication process of GMS publications on the GMS portal (1), i.e. the GMS editorial team at ZB MED for journals and conference publications, or DIMDI/BfArM for research reports. Users are in no direct contact with the archive. The Digital Preservation team assesses the suitability of digital objects (research literature) and associated metadata for digital preservation and pursues the goal of comprehensive (semantic) long-term digital preservation (2, 3). One of their core tasks is ensuring that objects can be reused by the designated community (see also R 0 and R 6) when they are returned to the GMS portal (see also R14). When the Digital Archive establishes archiving of a new collection, semantic long-term digital preservation will be the aim for the new collection as well. The workflow and the details for each collection will be defined in correspondence with the respective data provider, e. g. a research data repository. Responsibility for the formal quality of submitted metadata and original object versions for GMS research literature lies with the GMS editorial team and the editors. The required standards are also stipulated in the authors' contract (4). Since the GMS portal is the publishing portal of the Association of the Scientific Medical Societies in Germany (AWMF) (5) – and thus of the medical community itself – the specified publication standards are aligned with the corresponding community standards.

Publications are provided with bibliographic references based on the Vancouver standard, which are ingested into the digital preservation system unchanged. The quality of the content is verified by the editors. Should a submitted object fail to meet the specified standards, the data producers will be asked to rectify the situation (see also R 8).

Technical and administrative metadata are added to GMS's descriptive metadata by the Digital Archive. Various types of metadata are required to ensure objects are preserved for the long term (6).

Within Rosetta, all submitted metadata are written to a METS (Metadata Encoding Transmission Standard) file. In this METS XML file, various metadata types – descriptive and technical/administrative as well as structural – are represented.

The components of Rosetta information packages – Submission Information Packages (SIPs) and Archival Information Packages (AIPs) – are fully described and referenced within a Rosetta METS file.

Descriptive metadata

Descriptive metadata describe the content of a digital object and support its reusability and discovery. This type of metadata is recorded by the people responsible for the publication process of GMS research literature publication platform. It is made available via an OAI interface of the GMS portal, and transferred into the archive. ZB MED librarians catalogue conference publications, journals and research reports in the joint catalogue of the regional libraries (7) maintained by the hbz library network (North Rhine-Westphalian Library Service Center), entering them in accordance with the international cataloguing standard Resource Description and Access (RDA). Prior to 2016 the standard RAK-WB (rules for alphabetical cataloguing in academic libraries), which was the relevant standard at the time, was applied. These are transferred to the archive to enrich the descriptive metadata of GMS publications provided by the OAI interface.

Within the archival system itself, Rosetta employs the widely used Dublin Core (DC) metadata standard (8) to describe the content of digital objects. The DC elements are indexed in Rosetta. Metadata from source systems that use a different standard are mapped to DC elements by the Digital Preservation department.

Other metadata standards – e.g. MARC (machine-readable cataloguing) and MODS (Metadata Object Description Schema) – can be incorporated into the METS XML file as source metadata.

Technical and administrative metadata

Administrative metadata in Rosetta include technical, event and rights metadata relating to technical and legal aspects of digitally preserved resources. Within the METS XML file, these metadata are allocated to the section for administrative metadata (amdSec) and its subsections (techMD, rightsMD, digiprovMD). Some of this metadata is added by Digital Preservation staff after consultations with the GMS editorial office, though Rosetta extracts most of the technical metadata from the objects during ingest (see also R 7).

Administrative metadata are represented in Rosetta in the DNX metadata format. DNX – an XML schema developed by Ex Libris – is a technical implementation of the widely recognised PREMIS standard for digital preservation metadata (9).

The results of file format identification and validation processes carried out in Rosetta are also incorporated into the technical metadata; these form the basis for choosing appropriate preservation strategies.

Quality assurance

A detailed description of the quality assurance measures applied to objects (research literature) during object submission is included in the R 8 criterion. Format identification and format validation are performed by plugins during the Rosetta ingest process (DROID and JHOVE, see also R 7). Any errors that occur during ingest of objects and metadata are reported and logged by Rosetta. If an object is found to be corrupt, the Digital Preservation team will attempt to obtain a replacement from the data provider or initiate repair measures (3). Preservation actions such as repairs are logged in Rosetta's DNX metadata.

If repair or replacement is not possible, the Digital Preservation team archives the object anyway, including the error message.

Feedback from the designated community

Those responsible for GMS at ZB MED are in contact with the designated community (see also R 6). In addition, the archive operates community watch

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and exchanges information with GMS coordinators on object reusability and digital preservation standards. Users of the GMS portal can provide feedback through various channels (10.1, 10.2). The portal also offers the ability to analyse user behaviour by means of web analytics (11).

Links:

- [\(1\)](#)
- [\(3\)](#)
- [\(2\) ZB MED Preservation Policy, section 5.4](#)
- [\(4\)](#)
- [\(5\)](#)
- [\(6\)](#)
- [\(7\) Joint catalogue of the regional libraries hbz, only in German](#)
- [\(8\)](#)
- [\(9\) Rosetta AIP Data Model](#)
- [\(10.1\)](#)
- [\(10.2\)](#)
- [\(11\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R12 Workflows

Archiving takes place according to defined workflows from ingest to dissemination.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

Digital preservation is one of ZB MED's core tasks. It forms part of an object's life cycle in cases where the corresponding requirements are met:

- The object matches ZB MED's collection profile (1, 2).
- The digital objects concerned were acquired by ZB MED or are created (published) and stored at ZB MED (1, 2).
- ZB MED has been authorised by the producer to archive the object (3)
- Relevant metadata (4) are available and archiving is technically feasible.

Only the research literature published via GMS portal (5) are currently in the process of being digitally preserved.

The workflows in ZB MED's digital preservation system are based on the Reference Model for an Open Archival Information System (OAIS) (6).

Objects are ingested into the digital preservation system in their entirety (7, see also R 7). Ingest conditions are determined in consultation with those responsible for the collections (more specifically, the GMS editorial team at ZB MED) and are documented internally (see also R 8). In the case of the conference abstracts on the GMS portal, a subset of the data packages were prepared for ingest by Rheinware GmbH (8, R 0) according to the specifications of the GMS editorial team and the Digital Preservation department. The quality of the data packages was verified by the GMS editorial team and the Digital Preservation department.

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Ingest

The digital preservation process ingests objects into the digital preservation system in accordance with the Rosetta ingest functions. SIPs (Submission Information Package) are generated during ingest, with Rosetta providing the data model (9).

Ingest workflows are configured individually for each collection within the Rosetta system. At the moment, only workflows for GMS research literature exist. The Digital Archives sets up ingest workflows for new collections when the Archive decides to ingest them.

The processing steps in Rosetta are identical at the process level. At the technical level, objects are handled according to their format requirements using appropriate plugins.

Identifying, structural and descriptive metadata are recorded in a Rosetta METS XML file during the ingest process.

During deposit, Rosetta creates a checksum for each file. Various processes are carried out in the validation stack during ingest (e.g. extraction of technical metadata using JHOVE), of which the results are written to the METS XML file as administrative metadata. The extracted technical metadata are documented as part of administrative metadata based on the definition of significant properties for formats in the Format Library (10).

Archival Storage

In the archival storage, AIPs that are approved are deposited in storage areas (11). The AIP is delivered from archival storage to the "Access" function in Rosetta if access to the AIP is necessary. Archival storage hardware is managed by TIB. It is described in more detail in R 9.

Data Management

The OAIS Data Management functional entity is implemented in Rosetta. Database updates and queries in Rosetta are conducted across all workflows. Rosetta functions can also be used to create sets from intellectual entities (a logical unit, 12). These can then be used for further actions, such as preservation planning. Rosetta functions also enable the identification and documentation of archived content in Rosetta using metadata archived with that content, as well as general management of the archive using the administrative metadata.

Preservation Planning

The digital preservation system has a preservation planning module that can be used to create and analyse preservation plans and to carry out preservation actions (13).

ZB MED preserves the usability of objects by applying the preservation strategy of migration. Preservation actions such as migration and repair of GMS research literature are carried out in consultation with the GMS editorial team. In general, preservation actions depend on the various object and format groups and the defined significant properties (see also R 10). Research literature are published as PDF and XML.

Administration

The administrative level encompasses the management of the digital preservation system through

- establishing and maintaining ingest agreements, archive standards and policies;
- managing the system configuration;
- quality control; and
- reporting functions such as reports and statistics.

Access

Access to objects is described in R 14.

Since the ZB MED digital archive is a "dark archive", people who are not part of the Digital Preservation department cannot directly access the objects stored in Rosetta. Access copies are available for use on the GMS access platform.

If a trigger event occurs (i.e. the access copy on the access platform no longer exists or is defective), a new access copy is exported from the digital preservation system and forwarded to the access platform (14).

Security level

All legal requirements are observed regarding data protection and copyright. This is described in more detail in criterion R 2 and R 4.

Change management for workflows

Changes to preservation workflows are only made with the approval of the Head of Digital Preservation at ZB MED; any such decisions are documented. Changes are tested in the Rosetta development system and test system before being transferred to the production system.

Links:

- [\(3\) ZB MED Preservation Policy, section 5.3](#)
- [\(4\)](#)
- [\(5\)](#)
- [\(6\)](#)
- [\(7\) ZB MED Preservation Policy, section 5.7](#)
- [\(8\) Rheinware GmbH, in German only](#)
- [\(10\) Rosetta AIP Data Model, p. 49-50, p. 58](#)
- [\(11\)](#)
- [\(12\) Rosetta AIP Data Model, p. 9](#)
- [\(14\) ZB MED Preservation Policy, section 5.12](#)
- [\(9\) Rosetta AIP Data Model](#)
- [\(13\)](#)
- [\(1\) Collection Profile](#)

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- [\(2\) ZB MED Preservation Policy, section 4](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R13 Data discovery and identification

The repository enables users to discover the data and refer to them in a persistent way through proper citation.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

Access to the digital preservation system and research options

ZB MED's digital preservation system does not provide the option of external access and is operated exclusively as a "dark archive". Archived objects are made available to external users as access copies through the access platform, the GMS publication portal. These are research literature (journal articles (e. g. (1)), conference abstracts (e. g. (2)) and research reports (e. g. (3))) published via the GMS publication portal (4).

Only the Digital Preservation team has access to the contents of the digital preservation system. This access is granted to staff on the basis of Rosetta's built-in role management system.

Access copies of archived digital objects are indexed in the GMS publication portal, the access platform, and referenced in catalogue entries. These bibliographic references can be accessed through various systems including the LIVIVO search portal (5) and the joint catalogue of the regional libraries (6).

Access scenarios for the German Medical Science publication portal

The GMS publication portal provides free access to research literature (journals, conference publications and research reports).

The portal's research literature is in the process of being additionally transferred to the digital preservation system, where they are preserved in the dark archive.

Research literature published on the GMS portal can be searched for, located and used in the following ways:

All GMS publications can be found as indexed publications in the bibliographic database operated by the Federal Institute for Drugs and Medical Devices (BfArM) (7).

In addition, bibliographic references of GMS publications – including at the article level – are fully integrated into LIVIVO, the research portal for life sciences, which is developed by ZB MED (5). They are also indexed in BASE (Bielefeld Academic Search Engine (8)), a search engine operated by Bielefeld University Library for academic electronic publications that are available online. Publication data from selected journals are also delivered to PubMed Central, Medline, the Directory of Open Access (DOAJ) and other reference systems (9).

Due to search engine optimisation, users can also find GMS content via Google and Google Scholar.

The metadata of GMS publications are provided in a machine-readable format by means of an OAI-PMH interface and made available through the joint catalogue of the regional libraries after being catalogued (6). The Digital Preservation team receives descriptive metadata for archiving GMS publications through both channels.

To ensure the long-term discovery and verifiability of digital publications, each individual contribution in GMS is given a citable reference and a permanent and stable locator in the form of the persistent identifier DOI (10) and URN (11). These are stored in the descriptive metadata (12) and are ingested alongside objects into the Rosetta archiving system. The assignment of persistent identifiers ensures the long-term findability and verifiability of digital publications.

Rosetta uses its own identifiers for objects within the Rosetta system. Thus, each object is provided with an ID for the Submission Information Package (SIP ID (13)) during ingest, which does not change for the rest of the object's life cycle.

A SIP contains the object to be archived and its associated metadata. In addition, each object within the digital preservation system is provided with an

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Intellectual Entity Persistent Identifier (IE PID (13)). Each file is identified with a File PID (13).

Links:

- [\(12\)](#)
- [\(13\) Rosetta AIP Data Model, Internal Identifier, p. 57 and p. 77-78](#)
- [\(1\)](#)
- [\(2\)](#)
- [\(3\)](#)
- [\(4\)](#)
- [\(5\)](#)
- [\(6\) Joint catalogue of the regional libraries hbz, in German only](#)
- [\(7\) GMS search function, see under "Search in GMS publications"](#)
- [\(8\)](#)
- [\(9\)](#)
- [\(10\)](#)
- [\(11\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R14 Data reuse

The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

Access

Access copies of GMS research literature and their bibliographic metadata are made available to users through the open-access GMS publication portal. Bibliographic metadata are recorded by the librarians at ZB MED and indexed in the access platform system (see also R 13).

The terms of use for GMS publications are governed by a Creative Commons licence and designated accordingly on the platform (1).

The digital preservation system ingests objects from GMS as original archival copies (preservation masters) and delivers them back to the access platform if a trigger event occurs (i.e. if the access copy on the publishing platform can no longer be used). A copy of the preservation master is made whenever preservation actions are carried out; this is known as a derivative copy.

Possible trigger events include the following:

- The access copy no longer exists on the access platform.
- The access copy on the access platform is corrupt.
- The access copy on the access platform is at risk of obsolescence.

Where requested by those responsible for the GMS portal, Rosetta allows for the export of a DIP (Dissemination Information Package). This DIP can

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contain the preservation master and derivative copies, as well as all ingested metadata (2).

Metadata

During object archiving, metadata are recorded in the system (4); they are encoded in the Dublin Core standard (descriptive metadata) or as elements of the Rosetta data model (DNX data model, 3.1, 3.2) (technical/administrative metadata) and written to a metadata file (METS XML file). The use of widely recognised metadata standards guarantees the interpretability of the metadata.

- Descriptive metadata are collected to ensure that objects can be clearly described and identified. ZB MED librarians enter this metadata after the acquisition or publishing process into the publishing platform and/or the joint catalogue of the regional libraries. In Rosetta, descriptive metadata are indexed in the Dublin Core standard. Other metadata standards (e.g. MARC, MODS) can also be incorporated in the Rosetta METS XML file of archived objects.

- Administrative (including technical) metadata are incorporated in the digital preservation system in the Rosetta DNX metadata format. The DNX model is based on, and compliant with, PREMIS. The terms of use, in particular the access rights, are incorporated in the administrative metadata and can be exported together with the objects as part of the DIP.

Metadata types and metadata standards are described in more detail in R 11.

Formats

In the case of GMS, the GMS editorial team at ZB MED is itself the provider of data for the Digital Archive and is involved in the publishing process. In this case, the Digital Preservation department can, to some degree, consult with those responsible for the GMS portal, in order to decide which formats objects are created in (see also R 8).

The contents of the GMS portal (research literature, i. e. journal articles, conference abstracts, research reports) are available in machine- and human-readable format as HTML, XML and – in the case of journal articles – PDF. They are ingested into the digital preservation system in XML and PDF format.

Community Watch is used by the archive to monitor and take into account target group requirements regarding the file formats of digital content. Technical developments are monitored through Technology Watch and integrated into the digital archive's workflows where necessary (5).

One of the fundamental prerequisites for ensuring reasonable access in the future is that objects in Rosetta must be kept usable over the long term. The Digital Preservation team defines preservation actions for this purpose (5).

Where original file formats are threatened by risks such as obsolescence, it may become necessary to migrate objects to different file formats. Migration is carried out by the Digital Preservation team in consultation with those responsible for the publishing platform. Efforts are made to use open, standardised and widespread target formats.

For details of the designated community and its requirements for objects in the archive, see R 8. For a description of data and metadata quality, see R 11.

Links:

- [\(4\)](#)
- [\(1\)](#)
- [\(2\) Rosetta Staff User's Guide, p. 461 - 463](#)
- [\(3.1\) Rosetta AIP Data Model](#)
- [\(3.2\)](#)
- [\(5\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Technology

R15 Technical infrastructure

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The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

TIB hosts and administrates the digital preservation system for the three German National Subject Libraries TIB, ZB MED and ZBW. Accordingly, TIB provides the technical infrastructure for the digital archive of ZB MED as a service.

TIB maintains its own computing centre, administrated by the TIB IT-Service. IT-infrastructure for the digital preservation system (1, 2) is developed by TIB's IT and Digital Preservation team. Two independent NAS systems provide archival storage. Server racks for the NAS systems at the data centre are separate and locked. They are monitored automatically with regard to temperature, storage capacity, condition of the hard disk, and tasks such as replication. Objects and metadata are stored redundantly and snapshots of each NAS system are generated each day and before maintenance work. Integrity is monitored by checksums, for which differences will be reported and maintained by self-healing features of RAID-Z3 systems. Disaster recovery can be conducted from the unaffected NAS system and protection against data loss in case of power cuts and system crashes is provided. Defective hardware will be replaced as stated in the service agreement of TIB and service provider.

For technical infrastructure, TIB uses the BSI-Standard 100-2: IT-Grundschutz Methodology (3). The digital preservation software Rosetta conforms to the standard of the Open Archival Information System (OAIS). The OAIS specifications are also represented in the storage areas of the archival storage structure, like deposit storage area or permanent storage area (1).

The Rosetta Data Model supports data package structures in the lifecycle of a digital object according to OAIS standards.

The Rosetta Archival Information Package (AIP) data model is publicly described (4) and is based on the PREMIS reference model. The metadata of the AIP are populated with administrative metadata mainly based on the PREMIS reference model as well. For metadata standards, see also R 11.

Further developments of the technical infrastructure can be supported by the extendibility of storage space (2). For development of Rosetta, the software provider Ex Libris is in contact with Rosetta clients. Certified third-party software (5) and tools integrated in Rosetta are further developed by the respective responsible party (6).

As the archive is a dark archive, access demands of the designated community to the publications in general are met by the publication platform GMS.

Links:

- [\(6\) The tool JHOVE is developed by the Open Preservation Foundation](#)
- [\(1\)](#)
- [\(3\)](#)
- [\(4\) Rosetta AIP Data Model](#)
- [\(5\)](#)
- [\(2\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

R16 Security

The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

Compliance level:

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The guideline has been fully implemented in the repository - 4

Response:

IT security is overseen by TIB, as the infrastructure-hosting institution. It provides storage and administration services to the joint Rosetta digital preservation system of ZBW, ZB MED and TIB. TIB also has an IT security concept (confidential) based on BSI-Standard 100-2: "IT-Grundschutz Methodology" (1). TIB's Workflows, including its archival storage structure (2) and its technical infrastructure (3), are documented on its websites. Additionally, TIB has an appointed Chief Information Security Officer (4). Regarding security during access to the TIB technical infrastructure, access is established via https-protocol only. Data protection is supported by the archive's status as dark archive. Accordingly, access to the ZB MED digital archive is granted only to Digital Preservation department staff and specific access rights are assigned according to the role management provided by Rosetta. The ZB MED Digital Archive does not contain any objects with confidential information (see also R 4). Access for users to objects of which archival copies are maintained in the Digital Archive is ensured by respective publication platforms of ZB MED, like GMS, which provide necessary infrastructure. Continuity plans and exit scenarios are described in R 3.

Links:

- [\(1\)](#)
- [\(3\)](#)
- [\(4\)](#)
- [\(2\)](#)

Reviews

Reviewer 1:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Accept

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Applicant Feedback

R17 Applicant Feedback

We welcome feedback on the CoreTrustSeal Requirements and the Certification procedure.

Compliance level:

The guideline has been fully implemented in the repository - 4

Response:

-

Links:

Reviews

Reviewer 1:

ZB MED Digital Long-Term Archive

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Reviewer 2:

Compliance level:

The guideline has been fully implemented in the repository - 4

Comments:

Very good application.