



nestor

Explanatory notes
on the nestor Seal
for Trustworthy Digital Archives

nestor Certification Working Group





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nestor - Kompetenznetzwerk Langzeitarchivierung und
Langzeitverfügbarkeit Digitaler Ressourcen für Deutschland

nestor - Network of Expertise in Long-Term Storage
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Explanatory notes on the nestor Seal for Trustworthy Digital Archives

Introduction

The extended self-assessment process for digital archives developed and offered by nestor on the basis of the DIN 31644 standard offers digital archives a harmonised and practical method of checking whether they are trustworthy as defined in the "Criteria for Trustworthy Digital Archives".¹ If the assessment yields a positive result they are entitled to publicise this by using the nestor Seal for Trustworthy Digital Archives.

International Framework

The nestor procedure is more elaborate and its results offer greater accuracy than that of a simple self-assessment, yet it is less elaborate and is less accurate than an intensive audit conducted by external experts as part of a formal certification procedure. Within this context the nestor assessment procedure occupies a position in the middle of three assessment and certification options proposed as part of an EU initiative in the "Memorandum of Understanding" agreed in 2010. In this Memorandum nestor, the "Data Seal of Approval" and the "Repositories Audit and Certification" agreed upon three evaluation and certification levels². "Basic certification" under the Data Seal of Approval represents a simple self-assessment, the "Extended certification" represents a plausibility-checked self-assessment and "Formal certification" stands for an audit by external experts. Extended and formal certification are extensions of the "Basic certification" and both can be issued on the basis of DIN 31644 or ISO 16363.

The nestor procedure is based on the specifications contained in DIN 31644 and on the stipulations for "Extended certification" but does not constitute accredited certification.

¹ Print and commentary: Vertrauenswürdige digitale Langzeitarchivierung nach DIN 31644 / Christian Keitel und Astrid Schoger (Hrsg.). –, Berlin: Beuth Verlag, 2013.

² Memorandum of Understanding to create a European Framework for Audit and Certification of Digital Repositories. - 2010. <http://www.trusteddigitalrepository.eu>

Extended self-assessment procedure for obtaining the nestor Seal for Trustworthy Digital Archives

Object of the assessment

The DIN standard defines a digital archive as "an organisation (consisting of people and technical systems) which has assumed responsibility for the long-term preservation and long-term availability of digital data and its provision for a specified designated community." Accordingly, this assessment covers both organisational and technical aspects. Any digital archive which fulfils the above definition can be assessed, although not solutions which are exclusively software or hardware-based. Equally it is not possible to assess merely one part of a digital archive (e.g. only the archive storage).

The focus of the assessment is on the solutions used by the digital archive and not on the quality of the archived content. The assessment ascertains the archive's present state of development. Plans, future projects or former circumstances are not included.

Procedure

1. The institution wishing to obtain the nestor Seal notifies nestor of its assessment plans and nominates two contact persons for the procedure. It must also specify the object of the assessment precisely - in most cases this will be a digital archive within an institution. If an institution operates a number of mutually independent digital archives (e.g. one for its own output and one for submissions from external producers), these can either be assessed jointly (i.e. basically as "one archive") or separately (to obtain a number of different nestor seals). If multiple assessments are to be carried out within an archive, these should be weighted, described in full on the basis of the relevant criteria, and evaluated. The institution can include the services delivered by service providers in the evaluation (e.g. data centres for storage).
2. nestor confirms the start of the review to the institution, appoints one or more persons who are responsible for the review and sets the relevant processing deadlines for both sides. The entire audit should not take longer than three months.
3. The archive wishing to obtain the nestor Seal begins its self-assessment. The tools include an assessment form and the instructions and explanations regarding the

individual criteria. The appointed nestor person responsible for the review can be contacted with regard to questions of clarification.

The applicability of each criterion in the standard should first be checked for the case in question. Individual criteria can be excluded: sufficient justification must be given if a criterion is deemed not applicable.

Once the applicable criteria have been determined, the digital archive provides information on each one. It provides a sufficiently comprehensive written report on the implementation status of each individual criterion. It references documents in which the particular situation is documented, or appends these if they are not publicly available. The archive carries out its self-assessment, awarding points based on the following scale of fulfilment:

Not yet actioned	0	No fulfilment plans or documents exist yet for the criterion.
Planned	3	A written plan for fulfilment of the criterion has been drawn up. The plan not only draws upon approaches published elsewhere, it also refers to the specific situation in the archive.
Planned in detail	6	The plans have been prepared in detail. All the necessary information and approvals have been provided or obtained for implementation, which has already commenced.
Implemented	10	The plans have been implemented organisationally and/or technically. The measures have been incorporated into the archive's ongoing operations.

In the case of an assessment rating of 6 and 10 points, the documents will generally be authorised and in many cases published. If the documents cannot be published due to copyright, corporate secret or security reasons, they must be made available to the auditors. Confidentiality is ensured during the review. Working papers which

have been submitted for assessment but have not yet been published are sufficient for a 3-point rating.

In order to obtain the nestor Seal, criteria 1-12 may not be excluded and 10 points should be scored in each case. An average of 7 points must be scored for the remaining applicable criteria. These minimum requirements may change as advances arise in digital archiving. nestor updates the requirements at regular intervals.

4. At the end of the self-assessment the archive wishing to receive the nestor Seal presents its documentation to the relevant nestor contact person. The self-assessment and the documents submitted or referenced must be in German or English. The documents will then be submitted to a plausibility check by a nestor reviewer.

- Does the information provided meet the criteria and correspond to the related notes? Is it complete and up-to-date? Is it clear and comprehensible?
- Is the information presented in a logical form, is it internally consistent?
- Are the solutions appropriate in terms of the digital archive's targets and tasks?

If the reviewer reaches different conclusions regarding the situation to those of the digital archive itself, the archive will be requested to issue a statement. At the end of the audit, the reviewer will write a report and forward this to the second reviewer.

5. The second reviewer checks the work of the first reviewer and then, after consulting with the first reviewer, determines the final points total for the extended self-assessment. Finally the second reviewer decides whether the archive can be awarded a nestor Seal or not. A review report containing a summary of the results is written. This contains the following information: date of the review, object of the review, number of criteria applied, points attained in total and per criterion, justifications for excluded criteria. The archive and the nestor office are informed. If the archive does not agree with the decision, it can lodge an appeal with the nestor Certification working group. This adjudicates in all disputes and if any procedural aspects are unclear.

6. The Seal is valid subsequent to a positive assessment being issued once the digital archive has published the review report, its evaluation responses and all relevant documents together with the Seal in an easily locatable position on its website and once it has been added to the register of certified archives by the nestor administrative office. The Seal includes the year of issue. Formally, it is valid indefinitely. However, its relevance is likely to diminish after a number of years unless a further review is conducted. Nevertheless, there is no requirement to repeat the procedure.

Notes on the individual criteria

C1 Selection of information objects and their representations

Criteria have been defined for the selection of information objects and their representations in the digital archive. The framework is provided by legal obligations, the institution's or company's basic function, its own targets.³

To what extent must the criterion be met?

Implemented, 10 points

Explanation: This concerns the digital archive's role or mission. The type of digital information for which the digital archive is responsible must be clear both internally and externally. The selection must be transparently documented on the basis of criteria, guidelines and profiles.

C1 forms part of the definition of objectives and tasks of the digital archive and is therefore crucial for evaluating its trustworthiness, especially when assessing the adequacy of each activity.

Questions

- Which criteria have been laid down for selecting the information objects and their representations?
- What is the justification for these criteria?
- How can the criteria be accessed, internally and externally?

Documents⁴: Published criteria for the selection of information objects and their representations: legal basis, collection guidelines, catalogues and rules for appraisal and selection.

³ Vertrauenswürdige digitale Langzeitarchivierung nach DIN 31644 / Christian Keitel und Astrid Schoger (Hrsg.), - , Berlin: Beuth Verlag, 2013.

That equally applies to all criteria quoted and highlighted hereafter.

⁴ The documents in this list merely serve as examples (as in the notes on the other criteria). The precise documents which need to be submitted in an audit are defined in each individual case!

C2 Responsibility for preservation

The digital archive assumes responsibility for the long-term preservation of the information objects on the basis of legal requirements or its own objectives. Long-term preservation means ensuring the long-term usability of the information contained in the representations.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: What is important here is the archive's commitment. It undertakes to collect information but also to ensure that it remains permanently usable. The preservation archive should be fully aware of the consequences of making this (self) commitment.

C2 forms part of the definition of objectives and tasks of the digital archive and is therefore crucial for evaluating its trustworthiness, especially when assessing the adequacy of each activity.

Questions

- What is the basis of the archive's preservation responsibility?
- Which archiving tasks can be derived from this (documentation, storage, preservation of accessibility, access, ...)?
- For which period does the archive assume this responsibility?

Documents: Law, contract, voluntary commitment, policy, mission statement, strategy document.

C3 Designated communities

The digital archive has defined its designated community/communities. This includes knowledge of the specific requirements of the designated communities which influence the selection of the services to be provided. If the designated communities or their requirements change over time, the digital archive should adapt accordingly.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: The designated communities are essential for describing the preservation targets for the archived information. In determining its designated communities, the digital archive should bear in mind the questions the users will be asking when accessing the archive assets, and what previous knowledge they can be expected to bring with them. Changes in the designated communities and their requirements should be monitored and mechanisms installed for dealing with them.

C3 forms part of the definition of objectives and tasks of the digital archive and is therefore crucial for evaluating its trustworthiness, especially when assessing the adequacy of each activity.

Questions

- Which designated communities have been defined for the digital archive? How have they been defined?
- Which of the designated communities' specific requirements have been identified?
- How have the services offered been aligned with the requirements of the designated communities?
- Which methods are used for monitoring the changes in the designated communities (Community Watch)?
- Have plans been made to adapt the digital archive to changed designated communities and/or new tasks?

Documents: Description of the designated communities with their specific requirements, plus the monitoring method and legal or contractual basis.

C4 Access

The digital archive ensures that authorised users in the designated communities can access the representations. This includes appropriate search possibilities. The digital archive openly declares its conditions of use and any costs which may arise, listing these in a transparent manner.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: This criterion has three aspects: access, search and costs. It is stipulated that users must have access to the archived information. The nature of this access (e.g. remote or local access) can be decided by the digital archive. Access also includes offering search possibilities to find the archived information and also information on the terms of use and restrictions.

Questions

- How are authorised users guaranteed access to the digital archive?
- Which search possibilities exist?
- Which terms of use exist?

Documents: Documentation instruments (e.g. catalogue, finding aid), terms of use (including prices), documentation of access scenarios

C5 Interpretability

The digital archive has defined measures to ensure the long-term interpretability of at least one of the representations, thereby meeting a basic precondition for appropriate use now and in the future. This includes the interpretability of both content data and metadata. In ensuring this, the digital archive should take the needs of its designated community/communities into account. Changes to the technical environment or the designated community or communities can influence the interpretability of the objects. Using appropriate procedures, the digital archive should therefore check at regular intervals whether the objects can still be interpreted by the designated community or communities.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: This criterion constitutes part of the implementation of C2 "Responsibility for preservation", in particular preservation of the usability of the information - the most important area from the perspective of long-term preservation. In order to ensure the long-term usability, the (intellectual) interpretability of the representations by the designated community needs to be taken into consideration in addition to the technical aspects such as displays, reproduction, running etc. Migration or emulation measures should be planned to ensure that the representations remain usable. The intellectual interpretability should be supported by suitable measures for describing the context of the information's creation, suitable documentation of the data / structures / formats (representation information). The planned measures should be proportionate to the needs and use targets of the designated communities. The nestor "Digital Preservation Planning" guide can assist here. The digital archive must have documented its own considerations and planned measures.

C5 provides the conceptual basis for C11 "Preservation measures".

Questions

- How is the long-term interpretability of at least one representation of content data and metadata ensured?
- How are the use objectives and designated community needs taken into consideration?
- Which methods exist for the designated communities to check the interpretability on a regular basis?

Documents: Description of the strategies for long-term maintenance of the interpretability, preservation planning system

C6 Legal and contractual basis

The digital archive's ingest, archiving and access procedures are based on legal or contractual regulations concluded with the producers. The nature and scope of the delivery is regulated, as are the digital archive's archival obligations, the conditions of use and, where applicable, the costs.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: This criterion is linked to C1 and C2. Different legal or contractual regulations apply depending on the framework within which a digital archive operates. A legal deposit library is likely to be bound by legal deposit laws, a state archive by the State Archive Law, a special collection library by licence agreements with publishers, a research data archive by contracts with the data suppliers. It is important for the digital archive to know exactly which regulations apply to it and to ensure that either legal regulations or individual contracts exist for all relevant areas.

Questions

- How are the deliveries, the obligations of the digital archive, the terms of use and the costs regulated with the producers?

Documents: List of legal regulations and contracts

C7 Legal conformity

The digital archive monitors and documents conformity with relevant regulations concerning the ingest, archiving and use of digital objects. These include: data protection, protection of the rights of affected parties, confidentiality regulations, copyright and usage rights, internal and external compliance.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: The digital archive must first of all have identified which rights apply to it. Measures must be documented and implemented for each applicable right.

Questions

- How are data protection, rights protection for affected persons, confidentiality regulations, copyright and usage rights and internal and external compliance monitored?

Documents: List of relevant rights and documentation of measures for observing these rights.

C8 Funding

Valid budget planning exists, as does a long-term funding plan for the digital archive.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: The digital archive should first have identified all its current and prospective cost units and documented these in a cost model. This could include procurement, operating and licensing budgets covering hard- and software, personnel costs, consulting fees, costs for external services etc. All the current cost units must be sufficiently budgeted for in the current financial planning. The review should also include the processes set out in the procedural organisation (see C10), while taking the objectives and tasks of the archive into account.

In addition the funding plan should also include long-term forecasts which contain future projections for funding requirements of the digital archive. Few institutions are truly capable of safeguarding their funding beyond the current annual budget; accordingly it is sufficient for the plan to be documented here.

Questions

- Which cost model is used?
- Which budget planning documents exist?
- Which long-term funding plans exist for the digital archive?

Documents: Cost model, current budget planning, funding plans

C9 Personnel

Sufficient numbers of appropriately qualified staff are available. Updated job descriptions exist which set out the required qualifications of the digital archive personnel and contain an organisational chart and/or a staff development plan based on the tasks and objectives of the digital archive.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: This criterion contains two factors which the digital archive must define: What does it understand by qualifications, and what staffing levels does it regard as adequate? Based on the objectives and tasks of the archive, the review should also specifically include the staff responsibilities as set out in the organisational and procedural chart (see C10).

It should be noted that specialised formal training measures in the field of digital long-term archiving are still at the developmental stage in the German-speaking countries (principal among which are the initial and further training courses offered by nestor (nestor school, workshops).

Questions

- How many staff members are available (broken down by qualification and role), and what planning is undertaken?
- How do these factors help the digital archive perform its tasks?

Documents: Job descriptions, organisational chart, staff development plan

C10 Organisation and processes

The organisational structure should be appropriate for the objectives, tasks and processes of the digital archive. The structural and procedural organisation should be defined. The responsibilities should be established. The digital archive is incorporated at the appropriate point in the schedule of responsibilities.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: Here it is important to document how the organisational structure matches the objectives and tasks of the archive.

This criterion provides the basis for assessing the suitability of the funding (C8) and the personnel (C9).

Questions

- Which organisational structure (structural and procedural organisation) does the digital archive have?
- Which responsibilities have been laid down?
- How does this structure allow the archive to carry out its tasks?

Documents: Process model, schedule of responsibilities, organisational chart

C11 Preservation measures

The digital archive should conduct strategic planning as a means of preserving the digital objects entrusted to it. This should include imminent or expected tasks and specify the deadlines by which they are to be completed. Long-term planning should be based on the monitoring of legal and social changes, the demands and expectations of the designated communities and all technical changes relevant for the sustained preservation and appropriate use of the information objects in the form of their representations. Possible effects on task fulfilment are evaluated. Suitable structures and procedures exist for this.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: In order to undertake strategic planning of preservation measures, the digital archive must also consider aspects such as time, staffing and financial resources, legal restrictions, technical facilities etc. in addition to its objectives and tasks. The PLATO tool, for example, can provide appropriate technical support for such planning; it can be used to help draw up a substantiated and transparent preservation plan.

C11 takes the interpretability preservation strategies and plans documented in C5 to the next stage of concrete planning.

Questions

- What form does the strategic planning of preservation measures take?
- How does the planning correlate with the general objectives and the other aspects of the archive's work?

Documents: Preservation plan

C12 Crisis / successorship management

The digital archive is in possession of a plan which ensures continuation of the preservation tasks even beyond the archive's own existence. The digital archive should have made contingency plans. In such a case the preservation work must be continued in a different organisational framework, thereby ensuring that the set tasks can be carried out in full. Where this is not possible, any deficiencies should be documented. The digital archive should take precautions to ensure that the transition process can be defined, planned and implemented in good time.

To what extent must the criterion be met?

Implemented, 10 points

Explanation: This is conditional upon all processes and technologies in the digital archive, especially the export formats, being documented - i.e. these must be documented well enough for the digital archive as a whole, individual tasks and information objects to be transferred to a third party in case of emergency. If any resulting deficiencies appear likely, these should be documented. Agreements should be drawn up with possible successors where possible. (e.g. with state archives, central commercial archives etc.)

Questions

- To what extent has the digital archive ensured that the information objects are preserved even after the archive itself has ceased to exist?
- What constitutes a crisis which would necessitate the transfer of tasks to third parties, and how is this decided?
- What plans are in place in the event of a crisis?

Documents: Crisis plan, transfer declaration

C13 Significant properties

The digital archive identifies and documents which of the transferred representations' properties are significant for preservation of the information objects. In determining the scope of the properties to be preserved, a balance should be struck, bearing the archive's own targets in mind, between the technical possibilities and the costs of long-term preservation on the one hand and the needs of the designated community/communities on the other hand.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The purpose of digital preservation is to preserve indefinitely the properties of an information object which are deemed to be important (= "significant"), regardless of its current technical representation. The aim of criterion 13 "Significant properties" is to check whether the definition and description of significant properties of information objects have been taken sufficiently into consideration in the system architecture, the data model and the workflows.

C13 is a prerequisite for C17/18/19, as authenticity (as defined in DIN 31644) to be ensured requires the identification of significant properties.

State of the art: *Full compliance with this criterion cannot be expected at present, as more time is needed for the community to accept and implement the concept of significant properties. The "nestor Guide to Preservation Planning" should be consulted.*

Questions

- What does the digital archive understand by significant properties and how does it handle them?
- To what extent have the objectives of the digital archive been taken into consideration?
- How does the archive strike the balance between the work involved and the performance of the system on the one hand and customers' usage interests on the other?
- How have the significant properties of information objects been anchored in the system architecture, the data model and the workflow?

Documents: Documentation of the significant properties

C14 Integrity: Ingest interface

The digital archive has its own interface for ingesting the representations in a way which retains their integrity. The interface contains all of the functions and processes aimed at transferring the submission information packages from the producers, transforming them into archival information packages and incorporating them into the digital archive. The interface allows the producer and the digital archive administration to check and maintain the integrity of the representations.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The transfer process, in which representations of information objects are transferred from the sphere of responsibility of the supplier to that of the archive, is especially critical with regard to the need to protect the relevant data from corruption. The purpose of criterion 14 is to assess whether the ingest interface of the digital archive is suitable for ensuring that the representations are kept complete and intact in a reliable and transparent transfer process.

C14 and C21 - "Specification of submission information packages " and C22 "Transformation of the submission information packages into archival information packages" are mutually dependent. The functions of the ingest interface which ensure integrity represent a special aspect of C33 "IT infrastructure".

Questions

- Which functions are included in the system architecture to ensure the integrity and security of data during the ingest process (e.g. virus checks, checking of data integrity based on hash values for content data, metadata and submission information packages as a whole)?
- Are these checks carried out during the transfer and also during the transformation of the submission information packages into archival information packages?
- In the form of which processes are these functions incorporated in the system specifications? Which organisational and technical measures have been implemented?
- How does the archive deal with any errors detected during the integrity check?

Documents:

Technical documentation of the ingest interface including all processes, description of the transfer, transformation to archive package and storage workflows.

C15 Integrity: Functions of the archival storage

The archival storage provides functions necessary for checking and maintaining the integrity of the representations by the administration of the digital archive. The functions include recording of the archival information packages onto storage media, long-term storage, restoration of the archival information packages and all changes to the packages.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: Ensuring that the archived representations of information objects remain complete and intact for longer periods is one of the key requirements of archival storage in a trustworthy digital archive. To satisfy this requirement the system should provide a range of functions dedicated to recovering archive information packages in the event of damage. C15 is closely linked to C33 "IT Infrastructure" (especially archival storage) and C34 "Security" (specifically organisational-technical security concept measures).

Questions

- Which functions and processes are planned into the system for ensuring that the archive information packages remain complete and intact during the storage process (e.g. selection of suitable storage media, redundancy, refreshing, media migration)?
- Which mechanisms check the integrity of saved archive information packages for damage at suitable intervals?
- Which mechanisms are incorporated into the system, or are planned, for recovering damaged archive information packages? How are check routines and recoveries documented?

Documents:

Technical documentation of the archive storage, storage system, risk management, concept of bitstream preservation

C16 Integrity: user interface

The digital archive has an interface which allows users and the digital archive administration to check and maintain the integrity of the representations. This includes the transformation from archival information packages into dissemination information packages.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The archived representations of information objects must remain complete and intact during and after use, and be transparent for all parties involved. In order to fulfil this requirement the digital archive should be aware of and disclose the limits of its responsibility, undertake all aspects of the provision process (including the interpretation aids it provides) and offer users possibilities for making full checks of the integrity of the data they are given. C16 is linked to C33 "IT Infrastructure" and C4 "Access"

Questions

- Which measures are in place for ensuring that the requested information is complete and intact following conversion of the archive information packages into dissemination information packages? What procedure is adopted if the integrity is lost?
- Which possibilities does the user have for checking the integrity of the archived information from the time of transfer into the digital archive up to its use?

Documents:

Technical documentation of the user interface including all processes, access system

C17 Authenticity: Ingest

The digital archive has procedures which permit the authenticity of the representations to be assessed upon being ingested and the authenticity of the submission information packages to be assessed and protected.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The long-term preservation of the information objects can be deemed authentic if, once entered, the transferred representations of digital information objects can only be changed by deliberate and documented measures which ensure the preservation of significant properties. During the ingest process, the representations are transferred from the supplier's sphere of responsibility to that of the archive. The authenticity should be assessed on the basis of the specified significant properties and preserved in the further process stages. C17 is necessitated by C13 "Significant properties" and is linked to C33 "IT Infrastructure"

State of the art: Complete fulfilment of this criterion is not currently expected due to the close link to C13.

Questions

- Are process steps identifiable in the ingest process (transfer, transformation of the submission information packages into archival information packages and storage) which influence the authenticity of the object (severance from the data carrier, normalisation)?
- Which processes has the digital archive specified for protecting the authenticity of the current or prospective transferred information objects? How is preservation of the significant properties checked?
- What measures are taken if the authenticity is endangered?

Documents:

Technical documentation of the ingest interface including all processes.

Logging of all changes to the representations

C18 Authenticity: Preservation measures

The digital archive deploys methods which ensure the authenticity of the objects during implementation of the long-term preservation measures and document the degree of authenticity.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The preservation measures may make it necessary to create a new technical representation of a digital information object or to incorporate existing representations into a changed emulation environment. A trustworthy digital archive should ensure that the relevant objects retain their authenticity while undergoing these processes and that all measures should be permanently and transparently documented. C18 is necessitated by C13 "Significant properties" and is a particular requirement of C11 "Preservation measures".

State of the art: Complete fulfilment of this criterion is not currently expected due to the close link to C13.

Questions

- Which processes have been specified to protect the authenticity of digital information objects during preservation?
- How is the preservation of significant properties ensured in the migration process or in the implementation of new emulation environments? How is this monitored (automatically/manually, for all representations/a random sample)?
- How does the digital archive proceed if individual significant properties are not preserved, either in full or in part?

Documents: Logging of all changes to the representations, documentation of the process for monitoring the significant properties

C 19 Authenticity: Use

The digital archive allows the users and the administration of the digital archive to check and maintain the authenticity of the representations. This includes the transformation from archival information packages into dissemination information packages.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: A trustworthy digital archive should allow each user to check whether the requested representation is authentic as far as the digital archive's area of responsibility is concerned. The archive should also be capable of generating dissemination information packages which fulfil the authenticity requirement. C19 is necessitated by C13 "Significant properties"

State of the art: *Complete fulfilment of this criterion is not currently expected due to the close link to C13.*

Questions

- During transformation of the archive packages into dissemination information packages, how is the authenticity maintained, how are the significant properties preserved?
- Which possibilities does the user have for checking the authenticity of the archived information from the time of transfer to the digital archive?

Documents:

Technical documentation of the user interface including all processes, access system

C20 Technical authority

The digital archive obtains technical authority over the representations being ingested, allowing it to transform them into archival information packages and, if necessary, to carry out long-term preservation measures. Following the transfer, all necessary measures can be carried out without any technical restrictions.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: When a representation of a digital information object is transferred to a digital archive, the archive should obtain full technical power of disposal over the data being archived in order to carry out all subsequent measures without restriction. It must be ensured that any existing technical restrictions on use (e.g. encryption, copy and print protection etc.) are identified and disabled. C20 is a part of C21 "Submission information packages" Technical authority should be taken into consideration in C6 "Legal and contractual basis".

Questions

- Which processes are planned prior to the data transfer in order to ensure the digital archive's data authority on a permanent basis - legally, organisationally and technically?
- How does the digital archive ensure in practical terms that all technical restrictions on use of the representations can be identified and disabled? How are e.g. encryption, print and copy protection and time limits on readability handled?
- How does the digital archive achieve technical authority if representations are transferred with restrictions?

Documents: Agreement with the producers, description of the technical restrictions check.

C21 Submission information packages

The digital archive has issued specifications regarding its submission information packages. The digital archive agrees with the producers which submission information packages will be ingested (content data and metadata). The submission information packages are checked on the basis of the specifications.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: Criterion C21 "Submission information packages " serves to check the extent to which the digital archive has adequately specified the composition of data packages for data transfer. It should be determined which content data and metadata can be combined in which form into a submission information packages, and which agreements need to be made with the producers in order to implement these regulations. In addition there should be a procedure for checking conformity of the submission information packages with the regulation.

Specification of the submission information packages under C 21 is a precondition for criteria C14 and C17 "Integrity and authenticity of the ingest process"

Questions

- Which specifications does the digital archive have regarding submission information packages? Which content data are accepted? Which metadata are required? Are there special requirements and processes for the creation of submission information packages?
- Which measures exist for validating the conformity of submission information packages?
- Are defective submission information packages rejected before the transfer, or are corrective measures undertaken within a defined work area in the digital archive?

Documents: Specification of the submission information packages

C 22 Transformation of the submission information packages into archival information packages

The digital archive converts submission information packages into archival information packages.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: Once the submission information packages have been transferred, the digital archive will generally have to convert them into archival information packages. Depending on the archiving strategy, the existing data are converted, structured and/or supplemented with the metadata required for long-term preservation. C22 is linked to C14 and C17.

Questions

- How are the transformation processes of the digital archive specified? Which conversion and structuring measures are specified?
- Which quality assurance measures exist?

Documents: Specification of the transformation, description of the process

C 23 Archival information packages

The digital archive has issued specifications for its archival information packages. The digital archive defines which archival information packages (content data and metadata) are to be stored and in which form. The archival information packages are checked on the basis of the specifications.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The archival information packages to be preserved are created in the transformation process following the transfer of the submission information packages. A trustworthy digital archive should be in possession of precise specifications for its archival information packages. These should contain adequate information on the content data, the metadata required for long-term preservation and on the structure of the packages. Conformity of the new archival information packages with the specifications should be verifiable. Specification of the archival information packages in C23 provides the basis for specifying the transformations in C22 and C25. It is a precondition for checking the integrity and authenticity of the archival storage in C15 and C18 and for ensuring the interpretability in C24.

See C27-32 with regard to metadata as a constituent part of the archival information packages.

Questions

- Are the constituent parts and the structure of the archival information packages sufficiently specified?
- How is the quality of the archival information packages checked?

Documents: Specification of the object model; see C27-32 regarding metadata.

C 24 Interpretability of the archival information packages

Technical preservation measures are undertaken to ensure the interpretability of the archival information packages.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: To ensure the long-term preservation of the information contained in the stored archival information packages a trustworthy digital archive should define measures designed to prevent possible corruption of the bitstream of the saved files and take precautions to prevent the loss of interpretability of the content.

C24 specifies C5 "Interpretability" and translates the plans from C11 "Preservation measures" into action. The technical measures in C24 are documented in C 30 and C 31. Preconditions for C 24, of course, are protection at the technical level, bitstream preservation (C15).

Questions

- If there is a migration strategy: What approach is taken for migrating obsolescent file formats and how is it effected? Which quality assurance measures exist?
- If there is an emulation strategy: How are suitable emulators selected by the digital archive, the user or automatic processes?
- Which other interpretation aids exist?

Documents: Documentation of the migrations performed, specifications of the emulators, of an emulation framework, specification of further interpretation aids (representation information).

C 25 Transformation of archival information packages into dissemination information packages

The digital archive transforms archival information packages into dissemination information packages.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: If a user of a trustworthy digital archive sends a request to the archive, he is normally issued an dissemination information package. This dissemination information package must be created from an archival information package by the system in a transformation process. The dissemination information package may contain content and metadata from the archival information package and possibly additional metadata created for the specific purpose. The transformation process should be specified with an adequate level of precision; compliance should be transparent and verifiable. C25 is a precondition for checking the integrity and authenticity of the user interface/use (C16, C19).

Questions

- How is the process for transforming the archival information packages into dissemination information packages specified? Which changes are made to the content data and metadata?
- Which quality assurance measures exist?

Documents: Specification of the transformation, description of the process

C26 Dissemination information packages

The digital archive specifies the dissemination information packages on the basis of the requirements of the designated communities.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: A trustworthy digital archive should have precise specifications for its dissemination information packages. These should contain adequate information on the content data, on the metadata required for their use and on the structure of the packages. The dissemination information packages may only hold a part of the content information contained in an archival information package or may need to be transformed into a different file format. Conformity of the new dissemination information packages with the specifications should be verifiable. The purpose of criterion C26 "Dissemination information packages" is to check these quality criteria for defining dissemination information packages.

C26 is related to C3 "Designated communities" whose requirements need to be met, and to C4 "Access" which regulates basic matters concerning use.

Questions

- To what extent are the designated communities' requirements taken into consideration?
- Are the possible constituent parts and the structures of the dissemination information package specified in sufficient detail and in a way which is comprehensible for the user?

Documents: Specification of the dissemination information packages

C27 Identification

A digital archive should use internal identifiers to manage the information objects and their representations and, where applicable, their parts and relationships (part/totality, different variants, versions etc.), especially to ensure unique assignment of the content data to the metadata.

The use of externally visible, standardised persistent identifiers ensures reliable tracing of the information objects and their representations, and consequently also access.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The information objects, representations and their parts are permanently linked to each other. These links can only be preserved through the use of persistent identifiers. The identifiers should not change over the course of time (i.e. be permanent) and should be created using uniform specifications. They should be recognisable to external users, producers and others. By entering the identifier, external users should be able to find and use the required object. Possible specific requirements for identifiers are described e.g. in DIN 13646 "Requirements for the long-term handling of persistent identifiers".

Questions

- Which identifiers does the digital archive use?
- Which procedure has been used to give unique identifiers to all information objects, representations and their parts, and to all content and metadata?
- How is the identifier-based assignment conducted?
- How is the permanence of the identifiers ensured?
- How are the identifiers made available to external users?

Documents: Specification of the internal and external identifiers

C28 Descriptive metadata

The scope, structure and content of the descriptive metadata are defined. They depend on the goals of the digital archive, its designated communities and the object types.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The descriptive metadata classify and identify the content of the data being archived, make it possible to trace and simplify their use. Depending on the specific nature of the archive's role, its working methods and traditions, and depending on which content is to be archived for which designated community, the descriptive metadata may have a completely different content and structure and adhere to different description guidelines. These include both standardised (e.g. DC or EAD) and customised metadata schemata. The names of the metadata elements, the significance of the content and any mandatory fields should be determined. The relationship between the metadata and the data being described is defined.

Questions

- Which rules for specifying the descriptive metadata does the digital archive use? Which standards are deployed? To what extent are the goals, designated communities and object types taken into consideration during the specification of descriptive metadata?
- What measures does the digital archive undertake to ensure that the description guidelines are observed?

Documents: Specification of the descriptive metadata, notification of description guidelines used, standards and aids, documentation of current practice

C29

Structural metadata

The structure of the representations must be adequately described so that the information objects can be reconstructed and used.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: A representation of an archived information object can consist of many different technical components (generally individual files) which only become fully comprehensible when assembled in a structured context (e.g. the order of the pages of a book or the documents in a file). Depending on the type of object being archived, structural metadata serves to render the full context of the information object transparent and to make it usable.

Questions

- Which structural metadata does the digital archive use? To what extent does it reflect the different object types? Which standards are deployed?
- Which measures does the digital archive use to ensure that the structural metadata can be used for reproducing the authentic structure of different representations?

Documents: Specification of the structural metadata, notes on standards used

C30 Technical metadata

The technical metadata are defined to ensure interpretability, integrity and authenticity and to manage the preservation measures.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: Technical metadata describe the archived objects from a technical viewpoint. They simplify documentation of the completeness and intactness of the archive stock, facilitate suitable access forms and are required for the technical management of the preservation measures. Which metadata are needed depends e.g. on the type of object, on the chosen preservation strategy and on the objectives and designated communities of the particular archive. The PREMIS concept contains a common standard for technical metadata.

Questions

- Which technical metadata are collected? Which standards are deployed?
- Which processes (e.g. migration, provision) and statuses (e.g. integrity, authenticity) are supported or documented by which metadata?

Documents: Specification of the technical metadata, notification of standards used

C31 Logging the preservation measures

The digital archive logs the preservation measures and any changes to the representations.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: During the archiving process the transferred representations must either repeatedly be transformed into new representations or be expanded to include emulators (migration or emulation strategy). These changes have a direct impact upon the integrity and authenticity of the archived representations and information objects and must be systematically and permanently logged to ensure that all change processes remain transparent. It must be possible to view the logs. The PREMIS concept contains a common standard for logging preservation measures.

Questions

- Which measures and changes are logged?
- How are the measures and changes logged (e.g. automatically, manually)? Are the agents who are involved in the changes documented? Which standards are deployed?
- What measures are taken to ensure that log entries remain readable, comprehensible and utilisable in the future?

Documents: System for logging preservation measures, specification of metadata, notification of standards used

C32 Administrative metadata

The digital archive has defined its administrative metadata in order to render the administration and use of the information objects and their representations transparent.

Use of the representations may be restricted for legal or contractual reasons.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The internal administration and the access to archived digital objects must be conducted on an organised technical basis for legal or contractual reasons. The required administrative metadata must be systematically collected so that only permissible measures (e.g. multiple storage, migration and access for authorised users) can be performed. Which data are actually needed depends on the legal basis of the digital archive, its objects and user groups.

Questions

- Which administrative metadata are collected? Which regulations and standards is this based on?
- What relationship does the administrative metadata have to the information in C6 and C7?

Documents: Specification of the administrative metadata, notification of standards used

C33 IT infrastructure

The IT infrastructure should realise the specifications for handling the information objects and representations at the technology and security levels.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: The purpose of the IT infrastructure is to implement the technical and security requirements specified in C13-26. Accordingly, the infrastructure should be described in abstract terms, although its operation need not be comprehensively tested. The archive's own IT infrastructure or that (partly) operated by a service provider consists of hardware, cabling, software and interfaces necessary for operating the preservation archive. The purpose of C33 is to check and make transparent the appropriateness, reliability, security and future prospects of this infrastructure.

Questions

- Which IT infrastructure exists?
- What are the relationships between concrete structural decisions and other functional and technical decisions (cf. C13-26)?
- Which standards and guidelines have been implemented as a result?
- Which measures are planned for keeping the IT infrastructure up-to-date?

Documents: Technical documentation, graphic representation of the IT infrastructure (where appropriate)

C34 Security

The organisation and the infrastructure protect the digital archive and its archived information objects and representations.

To what extent must the criterion be met?

An average of 7 points must be achieved in the assessment of the applicable criteria C13 - C34.

Explanation: Every trustworthy digital archive must implement suitable measures to protect its own integrity and that of its archive assets to ensure that the assets remain intact and to fulfil its legal or contractual obligations. Such measures should be based on the identification of sections of the archive which are worthy of protection, an analysis of any potential threat to the specific archive and a risk assessment of the damage scenarios and ultimately result in a consistent security system (e.g., with the help of Drambora).

Questions

- Which parts of the digital archive are worthy of protection and to what extent?
- Which damage scenarios based on malicious actions, human error or technical failure do you regard as posing a particular threat to the preservation of the information objects and representations? How high is the likelihood of such damage scenarios? How serious is the damage? What level of residual risk is acceptable?
- Which measures are being taken to counter the threats?
- How have the risk analysis and the planned countermeasures been turned into a security system? Which standards and guidelines are being implemented?
- Which measures are planned for testing the security system and its further development?

Documents: IT security system and further infrastructure security systems