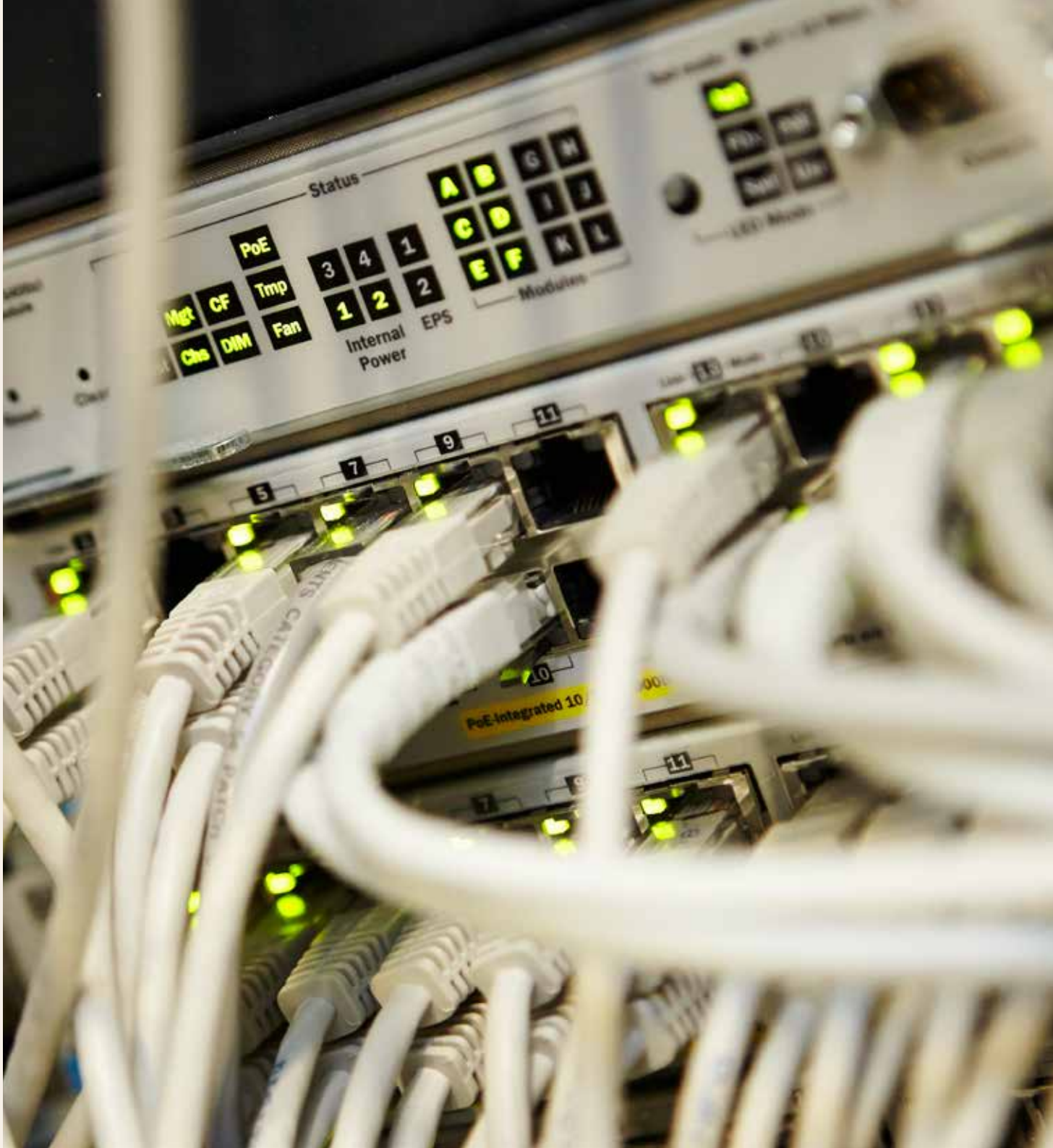# Digital Preservation Strategy 2025

TABLE OF CONTENTS

INTRODUCTION

This document describes the Danish National Archives' Digital Preservation Strategy. Based on the framework and principles in the the Danish National Archives' Digital Archiving Policy, the strategy presents our prioritized areas of action and proposals for specific implementation of these in the coming years.

This strategy does not replace the Danish National Archives' existing migration strategy but complements it. We will continue to base our work on the migration strategy by using a few long-lasting preservation formats to ensure that data can be accessed and reused in the long-term. However, we want to complement the migration strategy with new measures that overcome some of the disadvantages of the migration strategy, e.g., conscious or unconscious data loss or that significant properties of formats may be lost during migration. The new measures have the aim of ensuring that we can preserve more properties than previously and optimise reusability

The Vision of the Danish National Archives
"The digital archiving process of the Danish National Archives must ensure cost-effective preservation of several types of data worthy of preservation in ways that ensures greater reusability for users and enables faster access to data".

DIGITAL PRESERVATION STRATEGY

The Danish National Archives' Digital Preservation Strategy contains four strategic objectives and related areas of action.

Digital preservation deals with, amongst other things, establishing rules for preservation formats and the structure and content of information packages, as well as establishing a secure infrastructure for receiving, storing and disseminating digitally created data.

At the same time, digital preservation is intricately linked to other activities in digital archiving, which cover all parts of the data life cycle: from the time data are created and then submitted to the archives, where data are preserved and disseminated, to the time the data are reused when needed by society.

Because some of the preservation strategy's areas of action may have implications for other phases in digital archiving than just the preservation of data, the below new areas of action are elaborated where they have importance in, and across, digital archiving.

The prioritisation of the strategy's areas of action is based on the principles from the Danish National Archives' Digital Archiving Policy:

1. Reusability
2. Credibility
3. Security
4. Flexibility
5. Innovation
6. Cooperation
7. Standardisation
8. Transparency

Strategy for Digital Preservation 2025

STRATEGI 2025

We secure documentation of the Danish society for both the present and future	We put data into play so that they create more value for more people	We contribute to stream-lining the public sector

Strategic Objectives

Faster and better reuse of data	Joint maintenance of knowledge and tools	Preservation of more types of preservation-worthy data	Efficient and secure handling of growing amounts of data

Areas of Action

Issue new executive orders supporting that data are FAIR	Apply common European preservation formats	Apply new method for flexible addition of preservation formats	Implement a new secure system for receiving and preserving data
Create a basis for reusing original data	Collaborating on knowledge building, methods, and development of tools	Apply multiple preservation levels	Apply and develop innovative technologies
Document processes performed on data throughout their life cycle	Involve users in the assessment of the significant properties of formats	Introduce the possibility of preserving both the original and the preservation format	Analyze the possibility for intermittent submissions of data
Exhibit data and metadata in tools that optimize search in and across data	Collaborating on standards and services in the national, common infrastructure	Introduce models of export for flexible design of information packages	Analyze the possibility for secure digital submission of data

Figure 1:
The Digital Preservation Strategy of the Danish National Archives.

AREAS OF ACTION IN THE ARCHIVING PROCESS

Data Are Created - Collection

Data worthy of preservation must to the extent possible be identified at the earliest stage. This allows data producers to set up appropriate computer systems so that data are submitted to the archives in accordance with applicable rules.

The preservation-worthy data of the state authorities are primarily identified by the authorities reporting their new computer systems to the Danish National Archives. If the Danish National Archives considers the data should be preserved, the computer system undergoes an approval process. This process makes it probable that submitting data for archiving will not cause any problems. The process also ensures an early dialogue with the data producers about any challenges in relation to the submission of data. For state authorities, including research institutions and universities, an executive order has been issued for the reporting of research data under certain circumstances.

For municipal and regional authorities, the Danish National Archives has issued general preservation provisions, based on which the data producers must assess how to carry out long-term preservation of data from new computer systems.

Apply new method for flexible addition of preservation formats

When data worthy of preservation cannot be immediately submitted in accordance with applicable rules are identified, we will implement a new method for systematically evaluating new file formats for long-term preservation.

While preparing the submission of data, the Danish National Archives determines the delimitation of time, the model of submission, the content of the data and the documentation of the information package. The submitted information package must contain sufficient documentation of the embedded data and their context to be used and interpreted in both the short and long term.

Introduce models of export forflexible design of information packages

In this connection, the Danish National Archives must, in a structured manner, document all decisions regarding the selection of data and conversion as well as the origin of data and ensure that this information is transparent to users. Data selection means that the contents of an information package can be a 1:1 version of the data in the computer system, but it can also be a selection of tables from the database, an export of the most important data, or a compilation of data from several different computer systems. The Danish National Archives will work consciously to define and document the different types of export models so that the creation of the information package will be as transparent as possible for the users.

It is our objective that the documentation of information packages, especially in the form of structured metadata, as far as possible meets international standards on description of the structure and content of the information package.

Collaborating on standards and services in the national, common infrastructure

During the lifetime of this strategy, the Danish National Archives will explore the possibilities of "archiving by design". This means, amongst other things, that computer systems with data worthy of preservation are designed in such a way that the possibility of exporting data in standard formats to public archives are conceived from the outset. At the same time, we will have a sharper focus on engaging in and contributing to the Danish public sector's infrastructure by applying national standards such as DCAT-AP-DK to describe data catalogues, sets and services, the national standard for describing computer systems and offering access to data through borger.dk.

Data Are Stored - Submission and Long-Term Preservation

The Danish National Archives ingests data from hundreds of data producers every year. These include state authorities, research institutions and a large number of municipal, regional and private data producers. Data are created in many different formats, structures and data models. The submission of data to the Danish National Archives ensures that data are preserved according to a norm that provides preservation security, i.e., ensures the access to data over time. Data can be represented in different ways, e.g., have different structures and exist in different formats, but still contain the same information. Therefore, the Danish National Archives, first and foremost, preserves information. Data are mainly preserved in a different form than the original because data must be migrated to information packages with specific structures, formats and documentation that create cost-effective preservation whilst taking into account the obsolescence of technology.

The Danish National Archives validates submitted information packages. This validation of whether data have been submitted according to the Danish National Archives' specifications provides maximum assurance that data have been submitted correctly and remains accessible in the future. The Danish National Archives continuously monitors the submitted data and migrates them when we assess that data are at risk of technological obsolescence or if the Danish National Archives decides to apply other standards in its preservation methodology.

After the Danish National Archives has checked the submitted information package, we transfer the resulting archival information package to long-term preservation in the Danish National Archives' collections.

To address possible threats to data integrity and accessibility, the Danish National Archives bases its physical storage of data on distributed digital preservation. This means that data are available in multiple copies on multiple media technologies and in multiple locations and with an organisational separation between copies. Long-term preservation also includes regular checks on data integrity, so the Danish National Archives is sure that data remain unchanged between migrations.

Implement a new secure system for receiving and preserving data

The Danish National Archives is investing in a new system for receiving and preserving data. The system aims to ensure scalability, reduce personal dependencies, use standardised software, simplify and automate processes.

Data Are Reused - Access

Preservation-worthy data have great potential for re-use when they are submitted according to the Danish National Archives' standards for well-documented and system-independent archiving.

It is an objective to ensure that archived data are as easy to reuse as possible. This will be achieved by ensuring that our future development of methods and rulemaking are based on the archive's and the users' concrete experiences making archived data available and reusing data.

Issue new executive orders supporting that data are FAIR

The Danish National Archives work continuously to ensure adequate metadata, display metadata and data, which follow FAIR principles. This means that the Danish National Archives agrees with the objective that data must be Findable, Accessible, Interoperable and Reusable and that this must be ensured at all stages of the data life cycle – at any time when data are created, delivered, preserved, or reused.

The Danish National Archives' handling of the archival information package results in a dissemination information package, which is made available to users based on an ambition to disseminate as much data as quickly as possible. This ensures:

- Fast and automatic display of open data on the web
- Anonymisation of information packages
- Dissemination of data in new ways
- Digital disclosure of data to users

Exhibit data and metadata in tools that optimize search in and across data

Through considered efforts throughout the digital archiving process, we will ensure that dissemination information packages are created and can be used in accordance with the needs of the users. The Danish National Archives focuses on data being searchable, and that data from different sources can be combined and can contribute to the creation of new knowledge by supporting interoperability between information packages.

We will also seek to implement efforts as early as possible in the process to facilitate the anonymisation of data to ensure that data can be accessed with greater ease and speed. However, access to data always presupposes that data are available under the Archives Act and that data, thus, does not reach unauthorised persons.

GENERALISED CONSIDERATIONS

Preservation Planning and Methodology

Credible long-term digital preservation requires thorough preservation planning. By preservation planning, we understand it as the preparation of preservation plans for data structures and file formats, and more generally an assessment of when technological development necessitates migration of either media or formats.

An essential element of this is our dialogue and cooperation with data producers and other stakeholders, generating knowledge, situational analysis and ongoing technology monitoring covering activities related to collection, preservation and access.

Involve users in the assessment of the significant properties of formats

The formats for digital archiving selected and indicated by the Danish National Archives must be able to represent as fully as possible the significant properties of the original data formats. We must also work with users of original data to assess which of the properties of the formats are important to preserve in order to ensure that data can be reused for the desired purposes.

The Danish National Archives continuously strives to expand and adapt the formats assigned to long-term preservation to the needs of technological development, so that the Danish National Archives can, depending on the resources available, identify new formats for long-term preservation. Format assessment is carried out as transparently as possible on the basis of weighted criteria and based on the continuous collection of knowledge and experience.

Apply multiple preservation levels

However, situations exist where it is not possible to designate a suitable format for long-term preservation. To meet this challenge, the Danish National Archives will implement different preservation levels.

For example, one preservation level can be to preserve data in its original format until it is possible to convert the data to a format suitable for long-term preservation. This may be particularly relevant if a data producer is closing or if data are to be deleted from a data producer because of the data protection legislation.

There may also be situations where data cannot be appropriately submitted by the data producer. This may be in the case of data that cannot be preserved system-independently; if it requires subject-specific knowledge to preserve data; or in the case of substantial amounts of data. In such cases, data may be preserved in the context in which they were created, but subject to the provisions of the Danish Archives Act regarding preservation and accessibility.

Create a basis for reusing original data

If economically possible, the Danish National Archives will accept data in the original formats in addition to the preservation format. This can make it easier to find conversion errors when receiving and testing, while allowing users to access the original data for some time.

Cooperation and Standardisation

Collaborating on knowledge building, methods, and development of tools

Developing and maintaining solutions and methods for digital archiving are complex and must be handled through collaboration and the sharing of knowledge with other preservation institutions.

Apply common European preservation formats

The Danish National Archives will continue to participate in and contribute actively to national and international cooperation, in particular under the auspices of the European E-ARK Project, but also at the Nordic level. We will work to incorporate the relevant common European preservation standards into the Danish National Archives' regulations for digital archiving. The Danish National Archives uses the OAIS model as a reference framework for the archive's internal digital archiving processes.

The Danish National Archives has a high priority to cooperate with our designated community in relation to further development and maintenance of standards, rules, guidance materials, etc. This also applies to non-governmental and privately created data. Digital archiving is already an important part of information management by the public authorities in the same way as, for example, the GDPR, the law of access to public administration files, the law of public administration and good administration practices. The Danish National Archives works to ensure as much as possible and appropriate interaction between adjacent legislation and standardisation initiatives and the responsible authorities.

Reliable Data

Document processes performed on data throughout their life cycle

The Danish National Archives aims to preserve digital archives in a way that ensures that their credibility is maintained. Credibility is for us rooted in the documentation of the processes through which data pass.

It is our objective, in cooperation with public authorities and their suppliers, to develop traceability and documentation of the changes to data going from a computer system to archive. This assurance and documentation of the authenticity of data can, for example, be achieved during submission by comparing the archived data with original data. In addition, we focus on using checksums, documented procedures, conversion notes, etc. to support the traceability of data after submission to the archive in connection with validation, preservation, reuse and future migrations.

Innovation

Analyze the possibility for intermittent submissions of data

The Danish National Archives will create space for experiments that can promote the quick implementation of innovative initiatives in digital preservation. This could include analysis of intermittent submissions, research into reusing or preserving data, or contributions to developing anonymisation or validation tools that use artificial intelligence.

Apply and develop innovative technologies

The Danish National Archives has as an objective that it constantly works to develop, implement and use relevant new technology that can support activities in the archiving process, e.g., automation, artificial intelligence and machine learning.