National Archives of the Netherlands
Ministry of Education, Culture and Science

Preferred formats National Archives of the Netherlands

In view of sustainable accessibility

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Contents

1   Introduction

The National Archives' e-Depot can receive, sustainably store and make available digital information in a variety of *forms* and *formats*. But in light of digital sustainability, the National Archives has a number of preferred formats for the information supplied by the legal caretakers. This document describes those preferred formats and provides a substantiation for their use. This allows custodians to take sustainable accessibility into account from the inception of their information.

Context and cause

The document Preferred formats of the National Archives is an elaboration of its Preservation Policy. The Preservation Policy describes the overall policy for preservation, i.e. the way in which the National Archives keeps the digital information it manages authentic and useable. In addition to Preferred formats, the Preservation Policy is elaborated upon in other documents.[1] Figure 1 depicts the components of the National Archives' preservation policy.
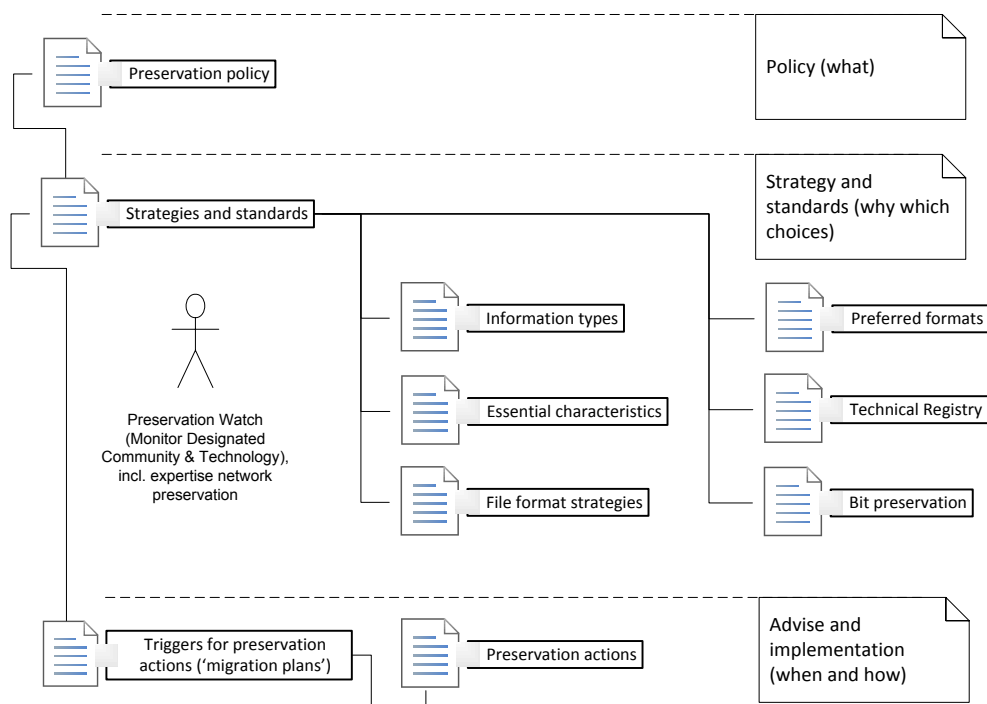

Figure 1 – preservation components

What does the Preservation Policy say about preferred formats?

In its Preservation Policy, the National Archives does *not impose restrictions* on the *number* of file formats included in the e-Depot, nor a restriction on the *type* of file formats. The assessment criteria are listed in section 4.2 of the preservation policy, under *Open Source and open standards*. Experience has shown that the current greatest risk of information loss is due to poor conversions, such as those from a closed to an open format.[2]

The National Archives' e-Depot is therefore set up to receive, store and provide all sorts of file formats. When a digital archive is ingested in the e-Depot a distinction is made between a *transfer* (which is permanent, and regulated by law) and *outsourced records management* (which is temporary and voluntary)

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[1]These documents are interrelated but may also be read separately.

[2]Source: preservation policy of National Archives section 4.2 *File formats and essential features*

What information types does the National Archives distinguish?
The National Archives expects to receive mainly digitised, and increasingly born-digital, information objects from central government in the coming years, in various file formats, such as TIFF scans (raster graphics), (Outlook) emails, PDF text documents and Microsoft Office documents (text documents, spreadsheets and presentations).

It is important to keep control when dealing with the many sorts of information and file formats. That is why the National Archives uses a subdivision in information types that is in accordance with national and international best practices and which is further compliant with best practices in the field. This approach benefits national and international cooperation and standardization and in doing so, our own efficiency. The National Archives uses the following subdivisions in information types:
1. Audio
2. Database
3. Document (text-based documents)
4. Email (messages)
5. Image (raster graphics)
6. Presentation
7. Spreadsheet
8. Vector image
9. Video

Which archives is this document about?
This document is about *transferred* archives that must be stored indefinitely because the strictest requirements apply. But in the event of *outsourcing* also, it is advisable to take into account the preferred formats of the National Archives. They are not only usable at the moment of outsourcing, but also when setting up processes and systems. After all, it is not always clear from the start if information should be stored for the shorter or longer term.

Who is this document for?
This document is intended to provide custodians with a point of reference. They can take the National Archives' preferred formats into account when setting up the records management or business process systems in which the digital archive will be formed. They will be able to take decisions at an early stage about the sustainability of governmental information. Custodians can also use this document for archives that have *already* been formed. They can use it to determine which actions are necessary to improve the sustainability of the archive, and how to properly transfer the archive to the National Archives.

The document Preferred formats is intended mainly for staff members such as information architects, records management (DIV) staff and records management or business process system administrators.

In addition, this document is also useful for archival institutions other than the National Archives. They can use it as reference or as input for their own policies.

Development and review
This document reflects the current views of the National Archives. As developments – in particular technological developments – are ongoing, it will require regular review. That means that the file formats will need to be reassessed on a regular basis and revised when necessary. Formats may shift from a 'preferred' to an 'acceptable' status or vice versa. New formats may be added or dropped. In the latter case transitional arrangements (to be formulated) will have to be made. If custodians deliver formats that no longer appear on the list of preferred or acceptable formats, the National Archives will review these with them.

Overview document
The document is structured as follows: Section 2 provides the rationale for why the National Archives – despite the lack of statutory regulations and technical restrictions – chooses to proscribe preferred formats for submissions to the e-Depot of the National Archives. Finally, Section 3 contains two

overviews: one of preferred formats and one of acceptable formats. The latter are formats that are not, or not completely, 'open' but still acceptable to the National Archives. The appendices contain additional information.

2   Why preferred formats?

In its preservation policy, the National Archives sets no restrictions on file formats. In addition, the e-Depot is technically capable of entering and storing a wide variety of file formats. But in light of digital sustainability, the National Archives has a preference for a limited number of file formats that meet open standards.

Archival regulation: 'open unless...'
The Archive Regulation 2009[3] provides further detailing of the Public Records Act 1995 and the Archive Decree 1995. The Archive Regulation includes many standards for materials, media, quality of information and archival store rooms. The requirements apply to all archive records to be stored permanently and that qualify for transferral to the National Archives or other depositories.[4]

The Archive Regulation[5] *states the following about the submission* of digital archive records in section 3 'Proper and accessible condition of archive records', article 26:

> *'Digital archive records must be stored in a fully documented file format that can be validated and that is compliant with an open standard no later than at the time of transfer, unless this cannot reasonably be asked from the custodian. In that case the administrator of the depository designated for transferral will be consulted about an alternative file format.*[6]

The Archive Regulation therefore does *not mention specific storage formats* for digital archive records, because of the continual and frequent changes in these formats. Instead of standards, the Archive Regulation just contains quality requirements instead of standards.[7] I.e.: a fully documented file format that can be validated and that is compliant with an open standard. The law thus prescribes criteria which archive records must meet at the time of transfer and sets the framework for the National Archives.

The National Archives' preservation policy also states this explicitly with the following advice: '*If near to the time of transfer, information must be converted to an open standard/format it is recommended to consult the NA beforehand as such conversion can result in an undesirable loss of information.*'[8]

Management and availability: easier with minimal diversity
The greater the diversity in supplied file formats, the more effort required to properly manage and make available all these different types of formats over time. The preferred course of action is therefore to keep the number of file formats to a minimum. The National Archives has extensive experience with various types of files and is now able to say that it can store these types of files for eternity and make them available to the public. More 'exotic' formats – i.e. little known and little used formats – will require greater effort from a management and availability perspective and therefore require more funds.

The National Archives' preservation policy states that the choice for non-open standards may affect:
- the accompanying preservation strategy, i.e. the active and passive preservation.
- the way information is rendered, because of the necessary viewers or freely available software.[9]

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[3]Regulation of the Minister of Education, Culture and Science, of 17 December 2009, no. WJZ/178205 (8189), regarding the sustainability and proper and accessible condition of archive records and the construction and set-up of archive rooms and depositories (Archive Regulation).
[4]Source: http://www.noraonline.nl/wiki/Wat_zijn_de_kaders_voor_Digitale_duurzaamheid%3F#Wettelijke_kaders (consulted 21-11-2016).
[5] More information about the Archive Regulation can be found in the appendices.
[6] Source: http://wetten.overheid.nl/BWBR0027041/2014-01-01#Hoofdstuk3_Paragraaf2_Artikel26 – 'General storage format requirements for digital archive records' (consulted 21-11-2016)
[7] Source: explanatory notes to the Archive Regulation, p. 33. See the appendix for the full citation.
[8] Source: National Archives' Preservation Policy section 4.2, Open source and open standards
[9]The National Archives' preservation policy states 'that the choice for non-open standards may affect:
- the accompanying preservation strategy, i.e. the active and passive preservation possible.
- the form of information provision, in connection with the necessary viewers or freely available software.'

Open standards and interoperability: as few obstacles as possible

Preservation – keeping digital information alive over time – is made easier by the adoption of open standards. The National Archives' views are compliant with the Dutch Standardisation Forum, which supports the Dutch government in the development, use and establishment of open standards for electronic information exchange. [10] In areas where the Dutch Standardisation Forum has not or not yet defined a standard, the National Archives follows the recommendations of the Digital Heritage Netherlands (DEN) knowledge centre. DEN developed a basic set of requirements[11] for the digitization of heritage and to guarantee the sustainable accessibility of digital data.[12]

According to the Dutch Standardisation Forum, an 'open standard' means readily available documentation, no obstacles due to intellectual property rights (such as patent royalties), opportunities to comment and independency and sustainability of the standardization organization.[13]
Open standards are managed by non-profit organizations. Everyone can make unrestricted use of open standards. It is also important that the decision-making process about open standards is accessible to all involved parties.[14] Government and semi-government agencies are required to demand the open standards listed when purchasing, building or restructuring IT systems and services.

To support interoperability, the National Archives has a clear preference for the 'open' formats on the Dutch Standardisation Forum's list.[15] Interoperability means the capability of organizations (and their processes and systems) to share information effectively and efficiently with their environment.[16] Furthermore, it means ensuring sustainable access to this information over the course of time. Open formats also form part of the DUTO quality requirements[17] that government bodies can use to determine which measures to take to make the digital information they receive and create accessible in a sustainable manner.

The Standardisation Forum's lists constitute a sound framework for the exchange of digital information between governments, and therefore also for the exchange with the National Archives. One caveat regarding these lists is that they concern systems purchased by government organizations and the obligation that these systems support the standards. The list of open standards thus includes in addition to certain file formats such as PDF/A-1 – standards for the exchange of messages, e.g. via Digikoppeling). The actual application of these standards must therefore be taken into early consideration i.e. in the set-up of work processes. Even though there is a list of file formats, in practice:

- … not the desired file format, but the standard storage format of the application is used. (For example, .doc in Microsoft Office, whereas text documents can also be saved as .odt)
- … the *use* of a standard only means that the information is readable, it gives no guarantees concerning the quality of the message *contained within* that information. Information stored in an open standard can still be unintelligible or inaccessible.
- … more information loss occurs during migration to one particular standard than in the obsolescence or inapplicability of the file format itself.

Source: Preservation policy of National Archives section 4.2, File formats and essential features.
[10]Source: https://www.forumstandaardisatie.nl/content/english/ (consulted 27-06-2017).
[11] DE BASIS stands for Digital Heritage: Building a Successful IT Strategy. Source: http://www.den.nl/pagina/199/ (consulted 21-11-2016).
[12]Source: http://www.den.nl/pagina/217/ (consulted 21-11-2016).
[13]Source: https://www.forumstandaardisatie.nl/open-standaarden/over-open-standaarden/ (consulted 21-11-2016).
[14] Source: 2011_Brochure_Standaardisatie_02, Wat is een Open Standaard? Brochure of the Dutch Standardisation Forum.
[15] More information about the Standardisation Forum can be found in the appendices.
[16]Source: http://wiki.nationaalarchief.nl/pagina/DUTO (consulted 21-11-2016).
[17] Source: http://wiki.nationaalarchief.nl/pagina/DUTO. (consulted 21-11-2016) DUTO stands for 'Sustainable Accessibility of Government Information' and was developed by the National Archives on the instructions of the Ministry of Education, Culture and Science.

3   Preferred formats and acceptable formats

The National Archives prefers digital information in 'open' formats for storage in the e-Depot. In addition to these preferred formats, the National Archives also recognises acceptable formats. This Section provides an overview of the preferred formats and the acceptable formats.

Two format categories
The National Archives uses two format categories:
- *Preferred formats*: these are the 'open' formats. In addition, for certain file types 'industry standards' may exist that are in widespread use and have been sufficiently documented.
- *Acceptable formats*: these are formats that are not, or not completely, open but still acceptable to the National Archives. A reason for this might be that the National Archives (or other national or international organizations) has experience with a certain format and has a sound preservation strategy in place.

What about other formats?
Formats that do not fall in one of the above categories are not excluded in advance from storage in the e-Depot. If information is offered for transfer in a format that falls outside these two categories, the National Archives will consult with the depositor. We will then issue a preservation recommendation for a suitable solution.

Summary of referred formats and acceptable formats

Information type	Preferred format	Acceptable format
Audio	WAV, WAVE, BWF	MP3, AAC
Database	SQL, SIARD, ODB	ACDB, MDB
Document	PDF/A-1, PDF/A-2, ODT	PDF 1.7, DOC, DOCX
E-mail	EML	MSG, PST, MBOX
Image	TIFF, PNG	JPEG, JPG, JP2, JPX
Presentation	ODP, PDF/A	PPT, PPTX
Spreadsheet	ODS, CSV, PDF/A	XLS, XLSX
Vector Image	SVG	In consultation
Video	MXF	MPEG-4, MKV

Overview preferred formats including substantiation

Information type	Format	Substantiation
Audio	WAV, WAVE	WAV (Waveform Audio File Format) is a file format often used for the storage of non-compressed audio data. It is a de facto published standard developed by Microsoft and IBM.[18]
	BWF	Broadcast Wave Format is an extension of WAV with a number of additional metadata fields. BWF is the standard preservation format for audio files of the Institute for Sound and Vision[19]
Database	SQL	SQL is included in the list of common standards of the Standardisation Forum. SQL is an ANSI/ISO standard language for relational 'database

[18]Source: http://www.den.nl/standaard/128/Waveform-Audio-File-Format (consulted 21-11-2016).
[19] See the Sound and Vision preservation policy: "Digital_preservation_Sound_and_Vision: policy, standards and procedures" (2016) p. 46

Information type	Format	Substantiation
		management system' (DBMS). This is a standardized language that can be used for tasks such as consulting and adapting information in a relational database. SQL can be used with almost all modern relational database products.
	SIARD	SIARD stands for Software Independent Archiving of Relational Databases. It was developed by the Swiss Federal Archives to permanently archive relational databases. SIARD consists of a format and a suite. The SIARD format is an open format for archiving the contents of relational databases.
	ODB	ODB belongs to the OpenDocument standard (ODF, NEN-ISO/IEC 26300:2007) included as a standard for Office documents in the 'comply or explain' list of the Standardisation Forum.
Document	PDF/A-1, PDF/A-2	PDF/A is widespread open standard, a NEN/ISO standard (ISO:19005). PDF/A-1 and PDF/A-2 are included in the 'comply or explain' list of open standards of the Standardisation Forum
	ODT	ODB belongs to the OpenDocument standard (ODF, NEN-ISO/IEC 26300:2007) included as a standard for Office documents in the 'comply or explain' list of the Standardisation Forum.
E-mail	EML	EML files are generally used to save individual emails as individual files. Appendices can be saved as MIME contents in those files or as separate files with a link from the EML file. EML is becoming a de facto industry standard.[20] The National Archives has extensive experience with this type of file format and has a sound file format strategy.
Image	TIFF	Tagged Image File Format is a simple, device-independent, OS-independent, readily exchangeable, 'industry standard' file format with a backward compatible stable core (TIFF baseline). TIFF forms part of DE BASIS of DEN.[21] The National Archives has extensive experience with this type of file format and has a sound file format strategy.
	PNG	PNG is included in the 'comply or explain' list of open standards of the Dutch Standardisation Forum, but only for the 'use of graphic images (with lossless compression) within ODF documents.'
Presentation	ODP	ODP belongs to the OpenDocument standard (ODF, NEN-ISO/IEC 26300:2007) included as a standard for Office documents in the 'comply or explain' list of the Dutch Standardisation Forum.
	PDF/A	PDF/A is widespread open standard, a NEN/ISO standard (ISO:19005). PDF/A-1 and PDF/A-2 are included in the 'comply or explain' list of open standards of the Dutch Standardisation Forum Please note that certain, interactive, functionalities will no longer be available after conversion to PDF/A format. If this functionality is considered essential, it is a reason not to opt for PDF/A.
Spreadsheet	ODS	ODS belongs to the OpenDocument standard (ODF, NEN-ISO/IEC 26300:2007) included as a standard for Office documents in the 'comply or explain' list of the Standardisation Forum.
	CSV	Where it concerns storage of non-interactive information from cells, the comma separated text file (.CSV) can be chosen as an

[20] See DPC Technology Watch Report 11-01 "Preserving Email" p. 22, accessible via http://dx.doi.org/10.7207/twr11-01
[21]Source: http://www.den.nl/standaard/39/Tagged-Image-File-Format (consulted 21-11-2016).

Information type	Format	Substantiation
		alternative for a spreadsheet.
	PDF/A	PDF/A is widespread open standard, a NEN/ISO standard (ISO:19005). PDF/A-1 and PDF/A-2 are included in the 'comply or explain' list of open standards of the Dutch Standardisation Forum Please note that certain, interactive, functionalities will no longer be available after conversion to PDF/A format. If this functionality is considered essential, it is a reason not to opt for PDF/A.
Vector Image	SVG	SVG stands for 'Scalable Vector Graphics'. It is a robust format based on XML for static and dynamic vector images. SVG is an open standard and support of the format has strongly increased over the course of time.[22] SVG is included in the list of common standards of the Dutch Standardisation Forum.
Video	MXF	MXF (Material eXchange Format) is an open standard maintained by the AV standardization organization Society of Moving Pictures Engineers (SMPTE). The format is intended for professional use and supported by a large number of different transcoders and editing software packages. MXF is the standard preservation format for video files of the Institute for Sound and Vision[23] MXF forms part of DE BASIS of DEN.[24]

Overview of acceptable formats including substantiation

Information type	Format	Substantiation
Audio	MP3	MPEG1-Layer 3 is currently the most popular format for storing audio. It is used to make lossy compressions. MP3 forms part of DE BASIS of DEN.[25]
	AAC	Advanced Audio Coding (AAC) is a non-backward compatible compression technology for digital audio. AAC was standardized by ISO and IEC (ISO/IEC 14496-3:2009), as part of the MPEG-2 and MPEG-4 specifications. AAC forms part of DE BASIS of DEN.[26]
Database	ACDB, MDB	Microsoft Access is a market leader in the field of databases running on Windows systems. The standard file format for Access databases has been .ACCDB since Access 2007. Before that it was .MDB. The National Archives has extensive experience with this type of file format and has a sound file format strategy.
Document	PDF 1.7	PDF 1.7 is included in the 'comply or explain' list of open standards of the Dutch Standardisation Forum for the exchange and publication of documents that cannot or can only partly be edited, of which information on origin and feature richness is part of the document and for which PDF/A-1 cannot be used as a standard. PFD 1.7 is an open standard and standardized by ISO and NEN as ISO 32000-1:2008.

[22] Source: The preferred formats document of Data Archiving and Network Services (DANS): DANSpreferredformatsNL.pdf, p. 12.
[23] Source: preservation policy of the Sound and Vision Institute "Digital_preservation_Sound_and_Vision: policy, standards and procedures" (2016) p. 45
[24] Source: http://www.den.nl/standaard/206/Material-eXchange-Format (consulted 21-11-2016).
[25] Source: http://www.den.nl/standaard/44/ (consulted 21-11-2016).
[26] Source: http://www.den.nl/standaard/357/Advanced-Audio-Coding (consulted 21-11-2016).

Information type	Format	Substantiation
	DOC, DOCX	Microsoft Office Word is the market leader in the field of word processing. The National Archives has experience with this type of file format and has a sound file format strategy.
E-mail	MSG, PST	Microsoft Office Word is the market leader in the field of email software (MS Exchange, Outlook). The standard format for saving emails is MSG. Email messages can be bundled in a Personal Storage Table (PST). The National Archives has experience with this type of file format and has a sound file format strategy.
	MBOX	MBOX is a generic term for a group of file formats used for a collection of email messages. All messages in an MBOX mailbox are merged and stored as plain text in one single file. In general, MBOX consists of one file with an .MBOX or .MBX extension and the complete contents of an email folder. Like EML, MBOX is becoming a de facto industry standard.[27]
Image	JPEG, JPG	JPEG (Joint Photographic Experts Group) is a widely used method to lossy compress digital images. JPEG is included in the 'comply or explain' list of open standards of the Dutch Standardisation Forum[28]
	JP2, JPX	JPEG2000 (JP2) is a standard that can perform both a lossless (reversible) and a lossy (irreversible) compression with one compression algorithm. Although JPEG2000 has been published as ISO standard it does not yet have native support, for example in web browsers. JPX is an extended version of the JP2 standard, with support for multiple images and more colour-coding options.
Presentation	PPT, PPTX	Microsoft Office PowerPoint is the market leader in the field of spreadsheets. The National Archives has extensive experience with this type of file format and has a sound file format strategy.
Spreadsheet	XLS, XLSX	Microsoft Office Excel is the market leader in the field of spreadsheets. The National Archives has extensive experience with this type of file format and has a sound file format strategy.
Vector Image	In consultation	In addition to SVG, no clear standards have been recognized for Vector Image.
Video	MPEG-4	MPEG-4 (Moving Pictures Experts Group-4) is currently the most-used video format and thus an industry standard. However, MPEG-4 is not an open format because of the royalties required. It was standardized by ISO and NEN as ISO/IEC 14496.
	MKV	Matroska (.MKV) is an open-source and highly flexible alternative to existing container formats such as AVI, ASF, MOV, RM, MP4, MPG and can contain almost all codecs. The disadvantage of MKV is that its support by video software is still relatively limited.

Disclaimer: this English version is a translation of the original in Dutch for information purposes only. In case of a discrepancy, the Dutch original will prevail.

[27] See DPC Technology Watch Report 11-01 "Preserving Email" p. 22, accessible via http://dx.doi.org/10.7207/twr11-01
[28] Source: https://lijsten.forumstandaardisatie.nl/open-standaard/jpeg (consulted 21-11-2016).

Appendix 1: Archival regulation

The relevant passages about transfer in the Archive Regulation 2009[29] can be found in section 3 *Proper and accessible condition of archive records*:

Article 25 Conversion, migration or emulation[30]

1. If, as a result of changes to operating or application software or of this software falling into disuse, there is a fair chance that the requirements under this regulation can no longer be met as regards the accessible and orderly condition of digital archive records, the custodian will ensure conversion or migration of those digital archive records or ensure that these digital archive records may be used or consulted by applying emulation in accordance with the manner at the time they were received or drafted by the government body.

2. The custodian will draw up a statement of the migration, which will include at least a specification of the digital archive files that were converted or migrated. It will also specify how and with what result a check was conducted to assess whether the conversion or migration complies or can comply with the requirements set under this regulation for the orderly and accessible condition.

Article 26. General format requirements for the storage of digital archive records[31]

1. Digital archive records must be stored in a fully documented file format that can be validated and that is compliant with an open standard no later than at the time of transfer, unless this cannot reasonably asked from the custodian. In that case the administrator of the depository designated for transferral will be consulted about an alternative file format.

2. Insofar as encryption technology is used at the time of transferral, the administrator of the depository will be given the accompanying decryption key.

3. Use of compression technology is only permitted insofar as it does not cause loss of information to the extent that it would be impossible to comply with the criteria set out in this regulation regarding the accessible and orderly state of digital archive documents.

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[29]Regulation of the Minister of Education, Culture and Science, of 15 December 2009, no. WJZ/178205 (8189), regarding the sustainability and proper and accessible condition of archive records and the construction and set-up of archive rooms and depositories (Archive Regulation).
[30]Source: http://wetten.overheid.nl/BWBR0027041/geldigheidsdatum_14-12-2015#Hoofdstuk3_2_Artikel25 (consulted 21-11-2016).
[31]Source: http://wetten.overheid.nl/BWBR0027041/geldigheidsdatum_14-12-2015#Hoofdstuk3_2_Artikel26 (consulted 21-11-2016).

Regarding this point, the explanatory notes to the Archival regulation state:

Section 3. *Orderly and accessible condition of archive records*[32]

In contrast to the Regulation for the orderly and accessible condition of archive records, this regulation does not include specific storage formats for digital archive records. These standards evolve so rapidly that inclusion in the regulation is not useful. In addition, new insights are continually being developed into the way in which sustainability of digital records can be achieved. The Archival regulation contains the requirements for the standards, instead of the standards themselves – it must be an open standard format (Art. 26 (1)). This is in line with the government's aim to use these standards as much as possible. Use of these standards reduces the dependency on software suppliers who because of their commercial interests will not readily provide information on storage formats and in addition continually launch new versions. Applying open standards is important from the creation of the archive. If the standards are applied later on, it will mean an additional burden because of the conversion or migration with the risk of information loss. As a rule, the sooner it is done, the more cost effective and easier to manage. This regulation is less timephased than the Regulation for the orderly and accessible condition of archive records. In practice, the validation of the storage formats applied by the custodian is expected to become a joint action by government organizations. Although the requirements regarding file formats apply at the time of transfer at the latest, many government organizations benefit from placing greater emphasis on the use of standards at an earlier stage. This is because in many cases they have to store the records for far longer than the lifetime of a software version and the accompanying file format (on average three years). To prevent digital files continually having to be converted and migrated – with consequent information loss – the use of standards is recommended.

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[32] Source: https://zoek.officielebekendmakingen.nl/stcrt-2010-70.pdf, page 33 (consulted 21-11-2016)

Appendix 2: Dutch Standardisation Forum and open standards[33]

The Dutch Standardisation Forum is committed to promoting open IT standards. Standards support the exchange of information between IT systems. The openness ensures that everyone can use the standard.

What are open standards?
A standard is an agreement set down in a specification document. In order to exchange information, IT systems must have implemented the same standard. A condition is therefore that the specification document is readily available.

All standards listed by the Dutch Standardisation Forum are 'open'. It uses 4 features which the standard must meet to be considered an 'open standard'.

1. The documentation necessary must be readily available.
2. There should not be any obstacles in the area of intellectual property right.
3. There must be sufficient possibilities for discussion by stakeholders during the further development of the standard.
4. The independence and sustainability of the standardization organization must be guaranteed.

The standards on the list are subjected to an assessment procedure to check whether they comply with the criteria for openness.

Why open standards?
The cabinet sets the application of open standards as the norm in various administrative agreements. For this reason an obligation to 'comply or explain' applies to all organizations in the public sector. This means that for the purchase of IT products and services above €50,000, a request must be made for the open standards on the list, where relevant ('**comply**'). An organization may only deviate from this open standard policy, if the organization reports this in its annual report ('**explain**').

Interoperability and supplier independence
The Dutch government uses an open standard policy because open standards contribute to the interoperability and independence from suppliers. The use of open standards in IT systems saves costs and eases the administrative burden.

Interoperability means the ability to exchange digital information between governments among themselves and between the government, companies and citizens. The use of open standards improves this communication because the IT systems understand each other.

Supplier independence means more freedom to choose an IT supplier. Open standards are not software specific and can be built into an IT system by any supplier.

[33]Source: https://www.forumstandaardisatie.nl/open-standaarden/over-open-standaarden/ (consulted 21-11-2016).

Publishing details