eIDAS Trust Electronic Archiving Services supported by the eArchiving Initiative

White Paper by the eArchiving Initiative

Version 1.0

Foreword

The eArchiving Initiative (or eArchiving Common Services Platform) is a procurement managed by the E-ARK Consortium and is funded by the European Commission under Grant Agreement No. LC-01905904.

The eArchiving Initiative represents the latest endeavour within a succession of European Commission-sponsored initiatives involving the E-ARK Consortium. It began with the first E-ARK project, supported by the European Commission under the Competitiveness and Innovation Programme 2007–2013, Grant Agreement No. 620998 within the Policy Support Programme. Subsequently, the E-ARK4ALL project followed, funded by the European Commission under the Connecting Europe Facility (CEF) Telecommunications sector, Grant Agreement No. LC-00921441 CEF-TC-2018-15 eArchiving. Preceding the eArchiving Initiative directly, the E-ARK3 project received funding from the European Commission under the Connecting Europe Facility (CEF) Telecommunications sector, Grant Agreement No. LC-01390244 CEF-TC-2019-3 E-ARK3. In addition, the European Commission has funded four 'Generic Services' projects each of which had significant leadership involvement from organisations within the E-ARK Consortium.

While the precise configuration of the E-ARK Consortium has varied over time, it has always comprised a mixture of organisations e.g., SMEs, universities, national and regional archives, as well as membership organisations such as DLM Forum (57 member organisations), the Open Preservation Foundation (35 member organisations) and the Digital Preservation Coalition (158 member organisations). As such, it has always represented a cross-section of the collective group of individuals, organisations, and institutions involved in the practice, research, and development of electronic archiving generally. The E-ARK Consortium collaborates, shares knowledge, and develops standards, tools, and best practices to address the challenges associated with the preservation of electronic records, documents, websites, datasets, and other forms of digital content.

Our work is supplied to the whole eArchiving community as open source material.

Mission Statement

The eArchiving Initiative of the European Commission supports the implementation of the new electronic archiving services established in the amended Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity (eIDAS2).

Context

As stated in the first article of eIDAS2: "This Regulation aims to ensure the proper functioning of the internal market and the provision of an adequate level of security of electronic identification means and trust services used across the Union, to enable and facilitate the exercise by natural and legal persons of the right to participate in digital society safely and to access online public and private services throughout the Union.... [establishing] a legal framework for electronic signatures, electronic seals, electronic time stamps, electronic documents, electronic registered delivery services, certificate services for website authentication, electronic archiving, electronic attestation of attributes, electronic signature creation devices, electronic seal creation devices, and electronic ledgers."

eIDAS2 introduces additional trust services compared to eIDAS1. One of them is the electronic archiving trust service. As stated: "Many Member States have introduced national requirements for services providing secure and trustworthy electronic archiving in order to allow for the long-term preservation of electronic data and electronic documents, and associated trust services. To ensure legal certainty, trust and harmonisation across Member States, a legal framework for qualified electronic archiving services should be established, inspired by the framework of the other trust services set out in this Regulation. The legal framework for qualified electronic archiving services should offer trust service providers and users an efficient toolbox that includes functional requirements for the electronic archiving service, as well as clear legal effects when a qualified electronic archiving service is used. Those provisions should apply to electronic data and electronic documents created in electronic form as well as paper documents that have been scanned and digitised."

From the perspective of the eArchiving Initiative, the foundation and rationale behind the electronic archiving trust service are largely consistent with the purpose and objectives of the eArchiving Initiative. Today, as a result of the outcomes of the Archiving Initiative and preceding projects, a set of tools, specifications and procedures can be offered to support the implementation of the electronic archiving trust services.

The Regulation states: "By ... [12 months from the date of the entry into force of this amending Regulation], the Commission shall, by means of implementing acts,

establish a list of reference standards and, where necessary, establish specifications and procedures for qualified electronic archiving services".

This white paper explores how the eArchiving Initiative outcomes can support these implementing acts and highlights possible issues of interpretation.

Terminology and Concepts

In eIDAS2 "**electronic archiving** means a service ensuring the receipt, storage, retrieval and deletion of electronic data and electronic documents to ensure their durability and legibility as well as to preserve their integrity, confidentiality and proof of origin throughout the preservation period."

This kind of service could be used for a range of organisations across both the public and private sectors. All of which need to archive electronic information securely and efficiently, encompassing electronic data and electronic documents essential for their operations. Regulatory compliance and business needs are the two main reasons for archiving information. In some cases, this includes long-term archiving of electronic data and electronic documents. In the context of archives and other memory institutions, '**long-term preservation**' refers to an extended 'retention period' during which archival materials are safeguarded and maintained for future generations. While the exact duration may vary depending on institutional policies, legal requirements, and the nature of the archived materials, it commonly implies preservation for decades, centuries, or even indefinitely. This ensures the continued accessibility and integrity of valuable historical documents and data and cultural heritage for posterity. Irrespective of the retention period, the most important electronic data and electronic documents that are significant for science, culture, and permanent legal security are recognised as archival records. For other communities or business needs, 'long-term preservation' may refer to a much shorter period. Consequently, '**the preservation period**' offered by an electronic archiving trust service and their relationship with 'long-term preservation' may lead to confusion without clarification.

A common characteristic of all types of electronic data and electronic documents is their rapid obsolescence, which is primarily due to their technical/technological characteristics. Risks to the integrity, authenticity, and usability of electronic data and electronic documents increase over time. Over the last three decades, electronic operations have replaced paper-based operations in organisations of all sectors, sizes and jurisdictions. This transformation has forced the simultaneous development of approaches, methods, and services to mitigate the risks on the electronic data and electronic documents produced as evidence of these operations. For this reason, electronic archiving is strongly linked to **digital preservation** measures. The simple storage or replication of electronic data and electronic documents without considering preservation needs has become the

main source of loss of information usability. Acting in the early stages of electronic archiving is the best option to guarantee the integrity, authenticity and usability of the electronic data and electronic documents as long as they are needed.

Focusing solely on the technical aspects of preservation, such as digitisation, storage formats or security protocols, may lead to the loss of contextual information surrounding the data or information being preserved. For example, a historical document might lose its significance if it is digitised without preserving the context of its creation, its authorship, or its historical importance.

Another concern is the potential neglect of the more subtle aspects of preserved material, such as cultural or business significance, emotional resonance, or symbolic value. If preservation efforts prioritise technicalities over these more intangible aspects, the essence of the information could be lost. For instance, a photograph might lose its emotional impact if its preservation only focuses on image resolution and file formats, neglecting the message, story or memory it represents.

Technical preservation methods can, of course, reliably capture the surface-level content of information but may miss the deeper meaning or interpretation associated with it. For example, preserving a piece of literature or a legal document involves more than just digitising the text; it requires capturing the nuances of language, literary devices, and cultural references that contribute to its meaning.

Preserving digital information over time is a complex challenge that requires the use of appropriate technologies and expertise and cannot be avoided when implementing electronic archiving. In some contexts, digital preservation could be used as a synonym for electronic archiving.

The eArchiving Initiative, and the former projects on which it is based, use the Reference Model of the **Open Archival Information System (OAIS) – ISO 14721**. It has become the foundation for the long-term provision of access to and usability of electronic information. The scope of the fundamental concepts of this standard is not limited to individual countries or the EU but is global. It is the same approach agreed upon by the CEN/TC 468 – Preservation of digital information.
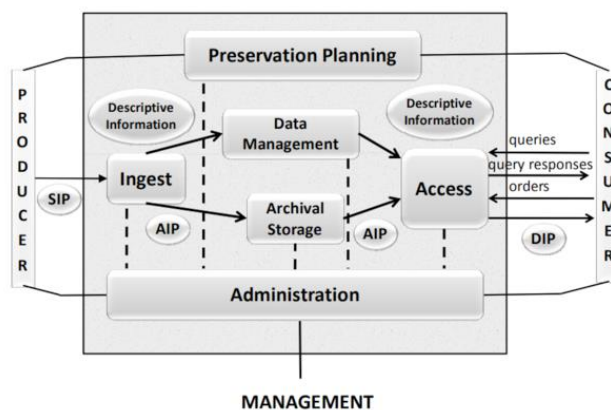
Although the terminology used in the OAIS reference model and eIDAS2 may appear different, there is a clear correspondence. For example, the ingest process can be recognised as the receipt function, while access represents the retrieval function. Other concepts such as durability, legibility, preserving integrity, confidentiality, and proof of origin are related to preservation planning.

For the eIDAS2 Regulation, "**trust service** means an electronic service normally provided for remuneration which consists of.... the electronic archiving of electronic data and electronic documents".

In several EU Member States, market demand for archiving services for electronic information (electronic data and electronic documents) has led to regulatory frameworks governing their provision. An analysis of these regulations shows significant coincidence with the concepts and functionalities defined by the OAIS reference model. The first publication of CEN/TC 468 will be a Technical Report showing the mapping of the regulations and standards used in some Members States, using the OAIS model as a reference.

In environments where **electronic trust archiving services** (or digital information preservation services) already exist, their users include both private and public sector entities. Important consumers of these services are the education and healthcare sectors, as well as local, regional, and national government organisations. Experience from these environments shows that the market needs a variety of services that are tailored to different types of data, specific content and, above all, the diverse needs of data owners and data users. Some archives and memory institutions offer electronic archiving services to other organisations, but eIDAS2 recognises that "in their capacity as organisations dedicated to preserving the documentary heritage in the public interest ..., they do not necessarily provide trust services within the meaning of this Regulation".

However, traditional archives and trust electronic archiving service providers share the implementation of a key functionality, which is to preserve the integrity, authenticity and legal admissibility of electronic data and electronic documents.

Organisations looking for a trusted electronic archiving service for their electronic data and electronic documents are those conscious of the fragility and insecurity of information that is stored only in servers, applications, or in the cloud without any other measure for its protection and usability.

For decades the market has offered solutions for electronic archiving. Implementing eIDAS2 electronic archiving services is an opportunity to extend accumulated knowledge and experience for increasing the market with a variety of electronic archiving trust services intended to meet different needs and types of information.

While the Regulation does not affect the services provided by national archives and memory institutions, they still need tools and technological infrastructures that provide them with trustworthiness. While these institutions are not obliged to offer commercial trust services, some of them may be clients of an electronic archiving trust service if the electronic archive service includes the vision of retention periods which are 'long term' and provide the connection with the preservation and provision of access and (re)use, permitting the national archives and memory institutions to become not only technical, but also content managers of the information and assuming the actual exercise of ownership rights and the responsibility for providing sufficient additional information to ensure the interpretation of the archived electronic data and electronic documents.

For the eArchiving Initiative, the inclusion of electronic archiving as a new trust service in the Regulation is a real opportunity for continuous collaboration among stakeholders, bringing the possibility to refine existing frameworks, streamline processes, and adapt to evolving technological landscapes by leveraging shared expertise and resources. Moreover, fostering public archives and private trusted services providers partnerships and promoting knowledge exchange initiatives can further bolster the resilience and adaptability of eArchiving and eIDAS electronic archiving trust services efforts.

Outcomes of eArchiving Initiative supporting implementation

The principal outcomes the eArchiving Initiative can offer for the implementation of electronic archiving trust services are the Information Packages Specifications and the eArchiving Reference Architecture.

The Information Package is one of the fundamental concepts of OAIS. Its key effect is that the information that is the original target of preservation is maintained in a way that ensures its integrity, authenticity, and interpretability.

The OAIS Reference Model itself does not determine specific requirements for the information packages. Instead, implementations of OAIS Archives need to lean on other standards or specifications for the structure of the package and the data to be

included in the different types of information packages. For this reason, the core activity of the eArchiving Initiative is maintaining and making publicly available a group of **specifications for information packages** (E-ARK specifications), which are being used in different organisations from almost all the Members States. These have a double objective: reducing the need for organisations to develop their own diverse internal specifications for information packages and achieving pan-European interoperability.[1]

On the other hand, the **eArchiving Reference Architecture** has clarified concepts in a multilingual and diverse environment, bringing together the IT perspective and archival specialist approach.[2] The eArchiving Reference Architecture describes the motivation, strategy, business, and infrastructure components for electronic archiving and digital preservation. It is planned to include a specific view of the eIDAS electronic archiving trust services.

The eArchiving Initiative also participates in European Standardisation through the **CEN/TC 468 – Preservation of digital information**, which has initiated a standardisation project on Functional requirements for electronic archiving services.

The CEN/TC 468 committee's objective is to standardise both the functional and technical aspects related to preserving digital information. Within this domain, it will formulate a structured array of standards, specifications, and reports tailored to address business needs, ensuring compliance with relevant European legislation and regulations (e.g., GDPR, eIDAS). The committee will cover various issues, including:

- Upholding the characteristics (integrity, authenticity, reliability, usability, etc.) of digital information throughout its life cycle.
- Developing, implementing, and overseeing preservation system processes (availability, confidentiality, etc.).
- Establishing audit and quality control procedures for digital information preservation.
- Promoting interoperability and facilitating information exchange among systems and services.
- Establishing procedures and processes to support legal admissibility.

It is important to note that the committee will not produce documents that duplicate or replace existing international or European standards, such as those

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[1] https://digital-strategy.ec.europa.eu/en/activities/earchiving-specifications

[2] https://kc.dlmforum.eu/earchiving-ra20/

developed by ISO/TC 46, ISO/TC 171, ISO/TC 20/SC 13, and ETSI. Collaboration with these committees will be maintained to prevent future overlaps. Additionally, products falling within the scope of CEN/TC 457, focusing on the digital preservation of cinematographic works, are excluded from the committee's scope.

Electronic archiving and digital signatures

As the Regulation states, "When electronic data and electronic documents submitted to the electronic archiving service contain one or more qualified electronic signatures or qualified electronic seals, the service should use procedures and technologies capable of extending their trustworthiness for the preservation period of such data, possibly relying on the use of other qualified trust services established by this Regulation. In order to create preservation evidence where electronic signatures, electronic seals or electronic timestamps are used, qualified trust services should be used."

Electronic archiving services should not solely revolve around electronically signed documents, but for this subset of electronic data and electronic documents slated for archiving containing one or more electronic signatures or seals could necessitate additional processing and potentially involve other trust services.

eArchiving Initiative is involved in the open discussion without a clear solution on how electronic signatures should be handled over the 'long term'. The technical ramifications of 'refreshing' the validity of electronic signatures every few years are not to be underestimated – this is not a practical solution over the long term. There is also the debate as to the meaning of the expression 'long term', which could be understood as involving decades, centuries or even longer.

At the same time, the eArchiving Initiative is working towards harmonising procedures and specifications for electronic archiving when a trust service is needed to preserve digital signatures. These efforts could be materialised in specific guidelines and procedures.

On the other side, electronic archiving services should uphold the highest standards of data security and integrity. This entails implementing robust encryption protocols, access controls, and audit trails to safeguard sensitive information against unauthorised access, tampering, or loss. Compliance with relevant regulatory frameworks, such as GDPR, further underscores the importance of prioritising data protection and privacy.

Electronic archiving services could use electronic signatures, seals, and timestamps as part of their procedures and technologies to ensure the integrity, confidentiality, and proof of origin of electronic data and electronic documents

beyond the technological validity period. In this case, other trust services in the Regulation can be used as part of the electronic archiving services. For example, an electronic archiving service can use certificates provided by trust services for the issuance of certificates, the validation of certificates or the validation of electronic signatures or seals.

The other trust services, especially the ones included in the eIDAS1 have their own standards and provisions in the current implementing acts.[3] To avoid the potential for confusion arising from the inadvertent blending of standards, solutions, and terminologies from these two distinct fields, the provisions and procedures to implement electronic archiving services need to be clearly and unambiguously articulated to be comprehensible. The unintentional mixing of the standards, solutions, and nomenclature of these two fields is likely to give rise to misinterpretations, which will significantly undermine the possibility of having a good range of electronic archiving services ready to be qualified as trust services.

Conclusion

Electronic archiving, as a part of information lifecycle management, is a complex discipline that must take into account many different components, ranging from knowledge, business rules and workflows to guidelines, specifications, and software tools. The eArchiving Initiative offers its 10 years of experience to support the implementation of eIDAS electronic archiving services.

In essence, the eArchiving Initiative represents a concerted endeavour to fortify the digital infrastructure of the European Union, safeguarding the integrity and accessibility of our collective digital heritage. Through sustained commitment to innovation, collaboration, and interoperability, it then becomes much easier to navigate the complexities of the digital age.

Acceptance from the electronic archiving community is crucial for the success of implementing electronic archiving trust services. The eArchiving Initiative is willing to contribute to achieving this aim.

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[3] https://ec.europa.eu/futurium/en/content/eidas-implementing-acts.html