2013 - 2023: A Review Of Ten Years Of Email Archiving In France

Marion Ville
Ministry for Europe and Foreign Affairs
Vitam Program
France
marion.ville@culture.gouv.fr

Abstract – Emails are an essential medium of communication. Their management is an organizational, security, legal and financial issue for all organizations.

The interdepartmental digital archiving Vitam program, which develops a digital archives management system on behalf of the French government, could not help but wonder about the acquisition, preservation and access to the documents and data contained in email archives. In 2013, it carried out a proof of concept on email archiving, at a time when few archive services in France had embarked on the acquisition of this type of document.

Ten years later, the French landscape in terms of digital recordkeeping has changed significantly. In practice, some archives have put in place strategies for archiving email and tools have been made available to assist in their effort.

This article looks at the transition from theory to practice of a more operational acquisition of this type of archive in a French context.

Keywords – Email archiving, Appraisal, Preserving email, Tools, Proof of concept

Conference Topics – From Theory to Practice.

I. Introduction

Email archiving is now a common and unavoidable practice in French central administration.

In 2013, when the interdepartmental digital archiving Vitam program, which develops the digital archives management system called Vitam on behalf of the French government and has currently around 60 partner institutions from the public and private sectors, decided to carry out an international and national state-of-the-art study, as well as a proof of concept on the subject, there was little national expertise.

The 2013 report that was produced was a first milestone in the knowledge and mastery of the issues surrounding this type of archive [1].

Since then, it has been noted that French public archive services, in charge of record management and long-term archiving, have put in place strategies and methods for email acquisition. Tools have also been made available to facilitate the process.

These new practices and choices have brought to light new challenges facing the mass of email acquired, in terms of complexity of the processing to be carried out, preservation and access to email.

II. A Vitam Proof Of Concept

A. Objective and Process

The Vitam project team, in partnership with the Ministries of Culture, Foreign Affairs and Defense, conducted a proof of concept on email archiving between March and June 2013. The main objectives of this study were to:

- define a strategy for email acquisition, processing and preservation, adapted to the different contexts of the Vitam project partners,

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- identify the tools and technical functionalities required for the technical processing of these emails, prior to their transfer in the Vitam software,

- define a metadata model for the email archives in accordance with the requirements of the Vitam project team.

For this purpose, the Vitam project team based itself on a review of the literature and existing national and international experiences. The team also carried out technical tests. A report on this work was published in October 2013 [1].

B. First Part: Literature Review

The first part of the study was to produce a summary in French of the work carried out at both national and international levels.

In France, several documents containing technical and management recommendations were published in 2008-2009. On 3 June 2009, the French Archives Department (DAF) published an instruction disseminating and commenting on the directive published by the State Archives of Belgium [2]. Associations such as the Archival Policy and Project Managers Club (CR2PA) [3], FeDISA [4] or the Association of French Archivists had produced white papers or advice sheets. Institutions such as the National Archives [5] or the National Library of France had produced guides for internal distribution.

At the international level, at that time, the first summaries of experiments were produced [6]. As a result of this literature review, the members of the Vitam project team concluded that three approaches to email archiving existed:

- a "pedagogical" approach, the most widespread, whereby actors in the digital and archiving world tried to alert users to the consequences of their use of the messaging tool and tried to provide them with advice and guides to good practice (State Archives of Belgium [7], archives of the States of Alabama, South Carolina or Texas, Bibliothèque et Archives nationales du Québec (BAnQ) [8], The National Archives (TNA) [9], etc.);

- an "acquisition and preservation" approach, with a few major projects (the DAVID project of the Antwerp Municipal Archives [10], the project of the National Archives of the Netherlands [6], the archiving policy of the National Archives of Australia [11], the Collaborative Electronic Record Project led by the Smithsonian Institution Archives and the Rockefeller Archive Center [12]), which aimed to respond to the problems of medium-term and long-term acquisition and preservation of emails, in particular through the design of technical tools;

- a diplomatic approach, based mainly on integrity issues via the renewal of diplomatics initiated by the University of British Columbia and in particular by Professor Luciana Duranti as part of the InterPARES group [13], and addressed by the English project InSPECT [14].

C. Second Part: Experimentation

The second part of the study aimed to test the conversion from one format to another (.eml to .mbox, .pdf; .mbox to .csv, .eml, .pdf; .pst to .eml, .mbox) and the extraction of messages and attachments.

These tests were carried out jointly by the Ministry of Defense (Defense Historical Service-SHD) and the Ministry of Culture and Communication (National Archives and IT Department). They were carried out on the most commonly used email clients in the context of the French public administration: Thunderbird and Outlook.

They were performed with:

- two software packages on the market, Aid4Mail and EmailChemy, which ensured the conversion of messages and emails into standard formats (.mbox, .eml, .pdf, .csv);

- CERP Email Parser and Xena, software developed by archive services, which provided email processing in order to generate an XML envelope;

- tools available in open source libraries, Apache POI, CLibPST, Java LibPST, Java Mail, Mime4J, Tika, which provided metadata extraction from messages and emails, as well as processing to extract headers, bodies and attachments and to identify file formats, and DROID to identify file formats.

D. Conclusions and Proposals

1) For the authors of the study, the real challenges in preserving emails did not appear to be technical, but organizational, legal and archival, particularly for personal emails. The Vitam project team concluded with a few proposals:

- Organizational proposals: it was considered necessary to point out, at the highest level of the organizations, some simple rules relating to the use

of email accounts and the nature of the information exchanged. Awareness-raising actions could be envisaged.

- Legal proposals: it seemed useful to draft standard clauses in internal regulations and IT policies, as well as to draw up a standard protocol to be signed by staff members when capturing their messages.

- Technical proposals: The transmission to IT departments of instructions based on the recommendations of the InterPARES working group could be a first step. The development of additional plug-ins, particularly for the Thunderbird client, which would allow important messages to be exported on the same principle as the LiveLink project run by the Republic and Canton of Geneva, was a second interesting approach.

- Archival proposals: it seemed important to define a strategy for email acquisition adapted to the uses of the various categories of administrations and producers, by identifying the target email accounts to be acquired in each organization, a suggestion made by the French Archives Department in 2009. Finally, the experimentation of semantic analysis tools was also considered an interesting line of thought. The development of an XML schema for representing email archives could constitute a first action that the archive administration could initiate. Finally, the diffusion in French of the work carried out at the international level seemed to be useful, as well as partnerships with other archive services at the international level.

2) In addition, following the literature review and the tests carried out, and taking into account the state of its thinking in terms of metadata modelling, the Vitam project team began to define a methodology for collecting email accounts and messages.

- Concerning the acquisition, the tests carried out led the project team to recommend extractions of emails in .eml, .mbox and .pst formats. For accounts exported in .pst format, it was recommended to reduce as much as possible the processing time between the export and the transfer to the competent public archive service, in order to avoid problems linked to the fast obsolescence of the format.

- Concerning the constitution of SIPs, in a platform based on the Vitam software, the authors of the study proposed that the Submission Information Packages (SIPs) corresponding to email accounts should take the form of a zipped file including an XML format file describing the email archive and complying with the Standard d'Echanges de Données pour l'Archivage (SEDA) [15] and the hierarchical structure of the folders, with, for each message, the body of the message, the associated attachments, and the messages in their original format.

III. From Theory To Practice

Since 2013, new studies and methods for email archiving have been developed both internationally [16] [17] [18] and nationally, where, based on these various work, procedures have been established by certain French archive services, whether they are in charge of records management (Mission Archives of ministries, Council of State, etc.), long-term archiving (National Archives) or both (Ministry for Europe and Foreign Affairs), and tools have been made available.

A. Building Archiving Strategies

1) Identifying The Emails to Acquire

French public archives, following the CAPSTONE approach [19], have chosen to select not all of the emails produced, but the email accounts deemed to be the most engaging. For example, the Ministry for Europe and Foreign Affairs has identified around 500 email accounts amongst the 15,000 or so managed by the Ministry. The email accounts selected include those of deputy directors or assistant directors [20]. Other ministries and government structures follow the same principle. For example, the Mission Archives of the Prime Minister's Office has targeted the email accounts of the Prime Minister's direct collaborators and, within the administration, the email accounts of the most senior civil servants (e.g. director of the National Institute of Public Service, Secretary General of the Government, director of the Digital Department, etc.). For intermediate-level emails, the Mission's archivists have also prescribed only strategic emails to be archived [21].

Most of the time, the acquisition is carried out when the email account is closed. Since 2012, the Mission Archives attached to ministries have been acquiring messages when ministers and their staff have left office, especially after elections. The Mission Archives of the Prime Minister's Office has already collected no less than 180 email accounts

since then. And this type of acquisition has been increasing: while only two Mission Archives had acquired 7 messaging accounts in 2012, at least nine Mission Archives have gathered no less than 577 accounts in 2022.

A more targeted acquisition of email archives can also be carried out. This involves acquiring email accounts in use to carry out a specific mission, for example the organization of a particular event. Thus, the Ministry for Europe and Foreign Affairs chose to acquire the email accounts of the organizers of the COP21, the 2015 Paris climate change conference. The collection has included 1,772 email accounts, in various formats (.pst, .msg, .msf, .eml) [22]. Some Mission Archives did the same for the archives produced during the COVID-19 pandemic, although the acquisition strategies were different, depending on the circumstances and their organizational context. The Mission Archives of Social Ministries initially set up a procedure for acquiring the email accounts of agents employed as reinforcements in the health crisis center. 143 e-mail accounts were collected in this context.

However, is it appropriate to keep all of these email accounts? Some of them contain only a few records. The Mission's archivists are already planning a reappraisal of these email archives. The Archives Department of the Ministry of Justice proceeded differently. The archivists interviewed staff members of the health crisis unit in order to appraise their documentary practices and to determine the emails to acquire. When the producer had not prepared a folder on the subject, it was decided to acquire only messages filtered through approximately thirty keywords established with the agents' agreement. This has represented 100 GB of data, over a period from January 2020 to December 2022, for 15 personal email accounts and 3 institutional email accounts.

2) Acquisition Method

There are some differences in acquisition strategies. Mission Archives prefer to acquire email accounts in their original format, mostly in .pst format. Archivists sort the records before or at the time of acquisition, sometimes with the help of the producer. Afterwards, they do not process them any further before transferring them to the National Archives for long-term archiving, in order to preserve the email archives' integrity.

The National Archives, like the Ministry for Europe and Foreign Affairs, have chosen to acquire not only the raw export as obtained from the producer but also a version processed according to a specific protocol aimed at extracting messages from the .pst or .mbox container [23]. The National Archives accept raw exports in .pst and .mbox formats. This makes it possible to create a first SIP. The Ministry for Europe and Foreign Affairs accepts more formats [22]. In addition to this export, the National Archives require that messages in the form of .eml and .txt files, as well as attachments linked to the messages, are extracted from the .pst and .mbox containers. This constitutes a second SIP. This extraction is performed with the ReSIP tool provided by the Vitam program [24]. This tool can also be used for other processing: unzipping attachments, deleting folders without messages, folders containing messages that are considered private, business cards in .vcf format, logos in .emz format and files with the .dat extension [25]. It is this export that is meant to be used in case of an access request. This is also the way in which these two institutions guarantee the durability of this type of archive.

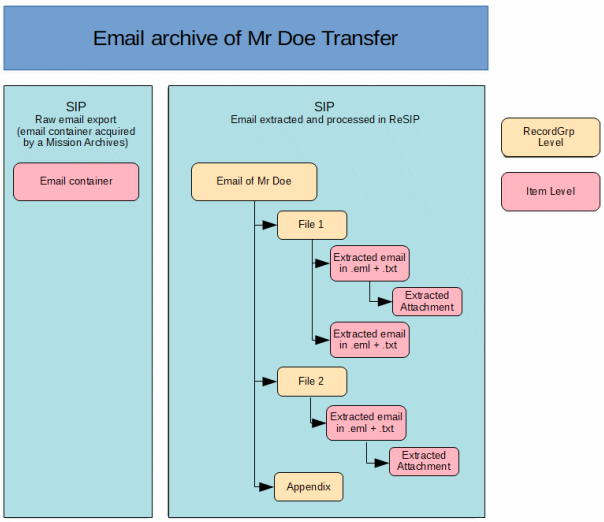

Fig. 1. Diagram of an email archive transferred to the National Archives

B. Strategies Formalization and Legal Construction

In the last few years, central government archives have begun to formalize their strategies in internal procedure notes and documents. They were made possible by the work on email archiving and digital preservation undertaken by the Vitam program [1], continued by the Interministerial Service of the French Archives, which has published a *vade mecum*

on the subject [26], as well as a note from the Interministerial Delegate for the French Archives dated 18 May 2020, which has requested central administration services to adopt an email archiving policy [27]. The formalization of these strategies has also been encouraged by exchanges between institutions within the Vitam program and within the National Formats Watch Unit. The latter was formed in 2019 to create a national space for thinking about and exchanging information on the issue of file formats and includes currently more than ten public institutions [28]. Internal experiments and studies have also confirmed these strategies, as was the case at the Ministry for Europe and Foreign Affairs [22] and the Council of State [29].

These strategies appear both in guidelines on the use of email accounts [30] and in notes emanating from the institution and aimed at raising awareness among departments about email archiving or informing them about acquisition procedures [29]. They take the form of lists of email accounts to be acquired, methodological guides designed to facilitate the appraisal of messages [21], practical sheets explaining how to create SIPs in conformity with the expectations of the archives [25][29] or defining roles and responsibilities, internal procedures aimed at organizing the acquisition, transfer or even search, valid for the whole institution or joint with certain departments. Very often, these documents are for internal use and are not disseminated outside the institutions concerned. It would be interesting to make them consistent.

C. Proposal of A Model

The Vitam program has also designed a model for structuring email accounts. It was first implemented with the MailExtract library [31], which has been integrated since 2019 into the Sedatools library, which is itself used by the ReSIP tool [24]. The library offers the possibility to import email accounts and messages in .pst, .msg, .eml and .mbox formats and to process them, offering several functionalities:

- extract messages from a .pst or .mbox container and migrate them to other formats: .eml, .txt,

- extract agendas and contact lists as a spreadsheet in .csv format,

- extracting the metadata of email accounts, and the textual content of the body of messages and their attachments as metadata embedded in a SEDA compliant XML file [15] or as a spreadsheet in .csv format.

The metadata extracted to this point from emails are:

- for folders, a description level corresponding to a group of documents (RecordGrp), their title, as well as the dates of the oldest and the most recent message;

- for each message, a description level corresponding to an item (File), its subject, the original identifier corresponding to the identifier of the message, the sender, the recipients and the addressees, the dates of expedition and reception, the reference to another message and the body of the message;

- for each extracted attachment, a level of description corresponding to an attachment (File), the name of the file, as well as a description specifying that it is an attachment (cf fig.1) [32].

IV. Current Challenges

A. A Documentary Mass to Process

In the presence of so many messages, it is difficult to quickly identify which messages should be deleted, even if archivists know which types of emails should be deleted (as personal messages, mailing lists, etc.). Some archives search for pre-defined keyword lists using ReSIP or Outlook [29]. However, this is a tedious and incomplete process.

There is a need to navigate in depth through email accounts in order to facilitate their processing. To address this need, the Mission Archives of Social Ministries has developed the Archifiltre-Mails tool [33]. The first version, released in the autumn of 2022 allows users to:

- import messages from Outlook (except for Office 365, which it is planned to support soon);

- explore emails and view messages by email domain, contacts by domain, years by contact, and then the messages themselves;

- export messages in .eml format;

- extract metadata and message content in spreadsheet form in .csv, .xlsx or .json formats. Date, sender, recipients, subject, message content, path in the classification plan, number, name and size of attachments are retrieved;

- add "delete" or "keep" tags;

- obtain statistical information.

The primary purpose of the tool, which is still being developed, is to be able to quickly identify messages that can be deleted [34].

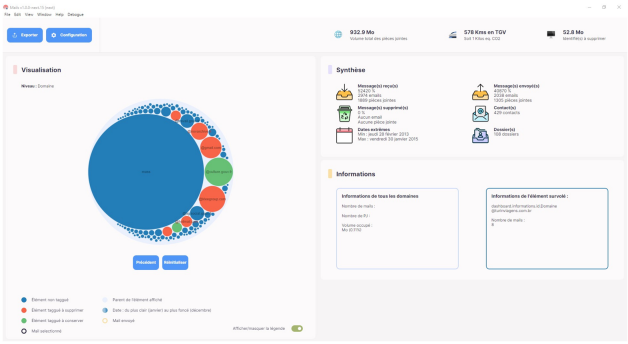

Fig. 2. Archifiltre-Mails dashboard and data visualisation.

The processing of messages may also be difficult or impossible without the original client, due to several factors:

- compatibility problems between the archive format and the software used to perform the processing (especially Outlook);

- digital workplaces and tools that are not sufficiently powerful to carry out the required processing, due to the size of the email archive;

- the errors contained in the email archives themselves. These are generated by the original client or by the producer. They are mainly detected during import attempts in existing tools such as ReSIP or Aid4Mail. They may be generated by duplicate messages, corrupted emails archives, attachments whose names exceed the limits allowed by Windows, whose encoding is not recognized, whose upload is blocked by another tool or which have been deleted. Repair is then manual and can be time consuming [22].

All these factors are often not well known by the profession. There is a need to increase competence in the issues related to the processing of messages.

B. A Documentary Mass to Preserve

E-mail accounts represent a large part of the digital archives acquired in recent years by the central administration's archive services. At the Ministry for Europe and Foreign Affairs, they constitute more than 40% of the stock preserved in their digital repository. The same can be said of the National Archives, where messages extracted from ReSIP represent about half of the descriptive and technical metadata recorded in the database for less than 0.5% of the deposits. If the flow of email acquisition continues, combined with a policy of extracting messages from ReSIP, this may raise a problem of technical maintainability for the repository system. This technical issue only applies for archives that have chosen to extract messages, a choice that is justified from an archival point of view, as it offers a guarantee of access and durability for this type of archive.

In order to reduce the number of extracted files and metadata, the Vitam program has proposed to test an experimental mode of compacting the extracted messages in version 2.7 of ReSIP [22]. Rather than having as many levels of description as there are folders and messages, the idea is to group all or part of the metadata extracted from the email archive at the most relevant level, determined by the archivists, in order to maintain the possibility of searching in the messages. The converted folders and messages, as well as the attachments, are placed in a .zip file.

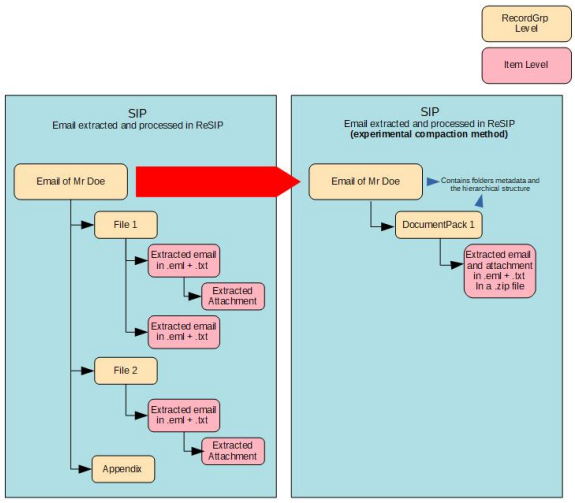

Fig. 3. Comparison between standard extraction and experimental extraction with ReSIP

The version extracted from the emails would then be smaller in terms of the number of levels of description, as well as the number and size of the files. Nevertheless, it raises questions in terms of:

- Durability, as the .eml and .txt files and attachments are encapsulated in a .zip file, which is not a good candidate for digital preservation.

- Access. How do you make the link between an email identified in the metadata and the file encapsulated in the .zip file?

The next work to be undertaken by the Vitam program will aim to answer these various questions by proposing functionalities for accessing these .zip files, if this experimental mode is proven successful.

C. A Documentary Mass to Access

New types of requests for access, formulated under the Code of Relations between the Public and the Administration (CADA law), are emerging [35]. These queries differ from the usual requests since they concern very broad themes, or even the occurrence of a word. They require searches on a large number of recent and unclassified sources, such as email archives. However, each of the current archiving scenarios does not completely solve the problems related to the access of this type of archive.

In the case of the Mission Archives that acquire emails in a container format, access is done manually by reimporting them into Outlook or ReSIP, or even into Archifiltre-Mails. But the operation is not easy, because it takes time if the email archive is voluminous and the import may not be successful because of its volume, the archive itself or the archivist's digital workplace. One of the solutions envisaged to facilitate future searches would be, at the time of email acquisition, to generate a .csv file from ReSIP or Archifiltre-Mails, which would include the metadata of the messages and would be archived at the same time as the email, because this format is easy to use for consultation. After these issues related to import, archivists must understand the organizational logic of the email, appraise the messages found in regard to the respect of privacy and rights of communicability and extract those that have been retained for access. This method is currently impractical and time-consuming.

The National Archives, for their part, are currently studying other ways of accessing email accounts and messages in order to facilitate their consultation. They are currently studying Ratom [36], but also epadd++ [37] and Pêle-mél [38]. The latter tool is developed by the Pêle-mél project team, composed of teacher-researchers from the University of Angers, and funded by the Ministry of Culture. It is a prototype for exploring and visualizing acquired email accounts, using extracted messages in .eml format only. It aims to facilitate access to acquired email accounts by using artificial intelligence and machine learning technologies [38].

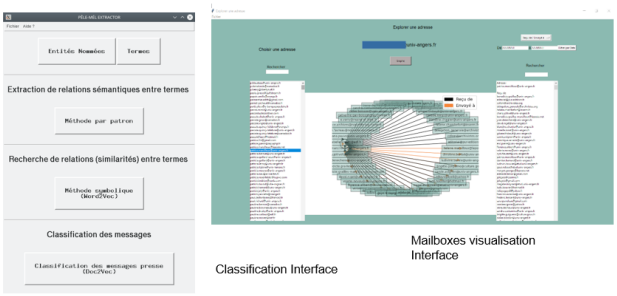

Fig. 4. Pêle-mél dashboard and data visualisation.

V. CONCLUSION

The Vitam program has provided a solid initial basis for further discussions for public archives thanks to its proof of concept, and then tools to facilitate email archiving. From a theoretical basis, we note that, in France, we have moved on to a more operational stage for this type of acquisition.

Nevertheless, in the face of massive documentary volume, this same phase has led to new questions, in terms of processing, preservation and access, as well as new experiments. Email archiving has not yet finished making waves

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