The PREFORMA Project: Federating Memory Institutions for Better Compliance of Preservation Formats

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Abstract. In this paper, we describe the motivations, objectives and organization of the *PREservation FORMAts for culture information/e-archives (PREFORMA)* project, a *Pre-Commercial Procurement (PCP)* project focused on conformity check of ingested files for the long-term preservation.

1 Introduction

Memory institutions, in Europe and elsewhere, are facing a situation when transfers of electronic documents or other electronic media content for long term preservation are continuously increasing. Data are normally stored in specific file formats for documents, images, sound, video etc. that are produced by software from different providers. This software is controlled neither by the institution that produces the files, nor by the institution that holds the archive. There is a risk that data objects meant for preservation, passing through an uncontrolled generative process, can jeopardise the whole preservation exercise.

PREservation FORMAts for culture information/e-archives (PREFORMA)[5] is a *Pre-Commercial Procurement (PCP)* project (2014-2017), co-funded by the European Commission under its FP7-ICT Programme. Its main objective is to give memory institutions full control of the process for testing the conformity of files to be ingested into their archives. This shall be obtained by developing a set of tools which will enable the testing process to happen within an iteration that is under full control of the institutions.

The paper is organized as follows: Section 2 provides an overview of the PCP instrument; Section 3 describes the overall approach adopted by the PREFORMA project for facing the problem of conformance check of file formats for long-term preservation; finally, Section 4 briefly reports on the current status of the project.

[5] http://www.preforma-project.eu/

2 Pre-Commercial Procurement

PCP[6] is an instrument which has been pioneered by the European Commission in the FP7 and is now fully part of Horizon 2020. PCP is appropriate when the required improvements are so technologically demanding that there are no near-to-the-market solutions yet and new R&D is needed. PCP can then be used to compare the pros and cons of alternative competing approaches and to de-risk the most promising innovations step-by-step via solution design, prototyping, development and first product testing.

PCP operates by clustering together stakeholders in a given domain – memory institutions in the case of PREFORMA – which group together in order to face a common technological challenge. The stakeholders consortium is in charge of describing the expected technological solution, specifying its needed features and characteristics, and defining how alternative approaches will be compared and assessed in order to understand their pros and cons. The consortium manages an open call for tenders where technological suppliers can apply and the selected suppliers will go ahead with the design and implementation of the requested technological solution. The consortium is responsible for monitoring the progress of the suppliers work towards the first product testing and for evaluating the final solution developed by the suppliers in order to understand which one best fits with their actual needs.

The PCP instrumente has several benefits, among which, to help:

- driving innovation in the public sector;
- reducing fragmentation in the demand of the public sector;
- stimulating the ICT developers to offer more challenging solutions;
- reducing the time-to-market of high-tech solutions.

Moreover, in some areas where there is less abundance of funding, as it is often the case of cultural heritage, grouping together stakeholders may help in promoting the development of required technologies whose costs would not be affordable by the single stakeholder alone.

3 The PREFORMA Approach

PREFORMA aims to establish a set of tools and procedures for gaining full control over the technical properties of digital content intended for long-term preservation by memory institutions [10].

The main objective of the project is the development and deployment of an open source software licensed reference implementation for file format standards aimed for any memory institution (or other organisation with a preservation task) wishing to check conformance with a specific standard. This reference implementation, called the *conformance checker* will consist of a set of modular tools, which will be validated against specific implementations of specifications

[6] `http://ec.europa.eu/digital-agenda/en/pre-commercial-procurement`

of standards relevant to the PREFORMA project and used by the European memory institutions for preserving their different kind of data objects.

A conformance checker:

- verifies whether a file has been produced according to the specifications of a standard file format, and hence,
- verifies whether a file matches the acceptance criteria for long-term preservation by the memory institution,
- reports in human and machine readable format which properties deviate from the standard specification and acceptance criteria, and
- performs automated fixes for simple deviations in the metadata of the preservation file.

The conformance checker software developed by PREFORMA is intended for use within the *Open Archival Information System (OAIS)* Reference Framework [5] and development is guided by the user requirements provided by the memory institutions that are part of the PREFORMA consortium. The conformance checker facilitates memory institutions in obtaining sufficient control of the information in an OAIS Archive, provided to the level needed to ensure Long Term Preservation [11]. In particular, the conformance check enables implementation of the following OAIS functions [11]: (i) *Quality assurance* at ingestion, validating the successful transfer of the *Submission Information Package (SIP)* to the temporary storage area; (ii) *Generate AIP* at ingestion, transforming one or more SIPs into one or more *Archival Information Packages (AIPs)* that conform to the Archives data formatting standards and documentation standards; and, (iii) *Archival Information Update* at ingestion, providing a mechanism for updating (repackaging, transformation) the contents of the Archive.

The media types addressed by PREFORMA are: (i) *text* for establishing a reference implementation for PDF/A [6–8]; (ii) *images* for establishing a reference implementation for uncompressed TIFF [3, 4]; and, (iii) *audio-video* for establishing a reference implementation for an audiovisual preservation file, using FFV1[7], Dirac[8] or JPEG2000 [9] for encoding video or moving image, uncompressed LPCM [2] for encoding sound and MKV[9] or OGG[10] for wrapping audio- and video-streams in one file.

4 Status of PREFORMA

PREFORMA has been launched in January 2014 and, on April 4th, 2014, it organised an Information Day[11] event in Brussels to present the call for tender, which has been launched as part of the PCP.

[7] `http://www.ffmpeg.org/~michael/ffv1.html`
[8] `http://diracvideo.org/`
[9] `http://www.matroska.org/`
[10] `https://xiph.org/ogg/`
[11] `http://www.digitalmeetsculture.net/article/follow-up-of-the-preforma-information-day/`

The call for tender opened on June 12th, 2014 and closed on August 12th, 2014 with a budget of 2,805,000 euros. 16 high-quality proposals have been submitted to the call out of which 6 have been selected[12] for continuing with the subsequent first design phase, which started in November 2014.

The first design phase will terminate in late February 2015 and the 6 suppliers which won the tender will be evaluated again according to well-defined criteria [1] in order to select those worth continuing with the subsequent development phase. The outcomes of the first evaluation phase will be reported on early March 2015 during a workshop which will be organized in Brussels[13].

In addition to the public events, PREFORMA is very much committed to communicate online with its community and for this scope there are two instruments that are constantly updated and monitored to get feedbacks from all the interested people via the project website[14] and the project blog[15].

Overall, the experience of PREFORMA is demonstrating that putting in place a joint PCP is very challenging, but it is also offering an opportunity of growth and learning, not only for the procurers (namely the memory institutions) but also for the technical partner who are supporting the implementation of the call.

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[12] http://www.preforma-project.eu/successful-proposals.html

[13] http://www.preforma-project.eu/design-phase-1-final-workshop.html

[14] http://www.preforma-project.eu/

[15] http://www.digitalmeetsculture.net/projects/preforma/