DELIVERABLE

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D8.1 Competitive Evaluation Strategy

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Contents

Executive Summary

This deliverable defines the *competitive evaluation strategy* which will be used for the assessment of the results of the suppliers at the end of the design phase 1. The competitive evaluation strategy serves to choose those suppliers which will pass the design phase 1 and will continue with the prototyping and testing phases.

Evaluating and comparing suppliers requires us to identify two distinct processes:

- *evaluation process*: during this process each supplier is individually examined and it is scored according to its characteristics.
  The evaluation process is formalized through the **evaluation matrix**, as described in Section 2.1.
  The outcome of the evaluation process is the **supplier score**, that is a number representing the scoring achieved by the supplier;

- *comparison process*: once the suppliers have been scored, they are compared with each other on the basis of their supplier scores.
  The comparison process is formalized through the **comparison matrix**, as described in Section 2.2.
  The outcome of the comparison process is a **ranking of the suppliers**, based on their scorings.

In particular, as detailed in Section 3, the PREFORMA evaluation matrix consists of four categories: *Impact on the Challenge*, *Technical Approach*, *Quality of the Tender*, and *Price/Cost*. Each category contains several items which are scored using a likert scale ranging from 1 (bad) to 5 (excellent), according to well-established standards, like ITU-T P800. The score for each item is obtained with a weighted average of the scores assigned by different reviewers which belong to the three following reviewer types: *technical expert*, *domain expert*, and *external expert*. The score of a category is the weighted average of the scores of its items and the total score for a supplier is the weighted average of its category scores.

1 Introduction

The aim of this document is to develop a painstaking method to *evaluate* and *compare* different suppliers. In particular, the developed method will be effectively employed in the evaluation and comparison of PREFORMA suppliers.

The proposed *competitive evaluation strategy* will be used for the assessment of the suppliers at the end of the design phase 1 in order to choose those who will continue with the prototyping and testing phases.

The proposed method is a general evaluation framework, which is applied to the evaluation and comparison of suppliers as a relevant use case. This means that the proposed method can be successfully employed in other projects, in addition to the PREFORMA project.

In the first part of the deliverable we present the general framework and in the second part we describe how it is applied to the PREFORMA case. In this way we can achieve two goals: first we obtain a general method for evaluation and comparison and we learn to adapt it to our needs; second we obtain the actual tool for evaluating and comparing PREFORMA suppliers at the end of design phase 1, which is the primary aim of this study.

The document is organized as follows: Section 2 describes the overall evaluation and comparison model; in particular Section 2.1 describes the design, the functioning and the properties of the evaluation matrix, while Section 2.2 illustrates the comparison matrix. Section 3 provides the design of the actual PREFORMA evaluation matrix. Appendix A contains confidential information agreed during the negotiation with the suppliers which will be checked at the end of design phase 1.

2 Evaluation Model

Evaluating and comparing suppliers requires us to identify two distinct processes:

- *evaluation process*: during this process each supplier is individually examined and it is scored according to its characteristics.
  The evaluation process is formalized through the **evaluation matrix**, as described in Section 2.1.
  The outcome of the evaluation process is the **supplier score**, that is a number representing the scoring achieved by the supplier;

- *comparison process*: once the suppliers have been scored, they are compared with each other on the basis of their supplier's score.
  The comparison process is formalized through the **comparison matrix**, as described in Section 2.2.
  The outcome of the comparison process is a **ranking of the suppliers**, based on their scorings.

2.1 Evaluation Process

The evaluation process aims to grasp and model the principal aspects of the complex reality of interest.

The following entities are utilized to capture and formalize the different aspects of the evaluation process:

- **Category**: represents a main aspect of a supplier under examination. A category covers homogeneous properties of a supplier;
- **Item**: describes an elementary constituent of a category and it is used to detail a category;
- **Reviewer Type**: takes into account different angles according to which a category can be assessed, i.e. different facets and standpoints of a category. For example, within the same category we may consider the viewpoint of both a technical expert and a domain expert.

Figure 1 shows the relationship among category, item and reviewer type: a category is composed by different items which are evaluated from different point-of-views – i.e. reviewer types.

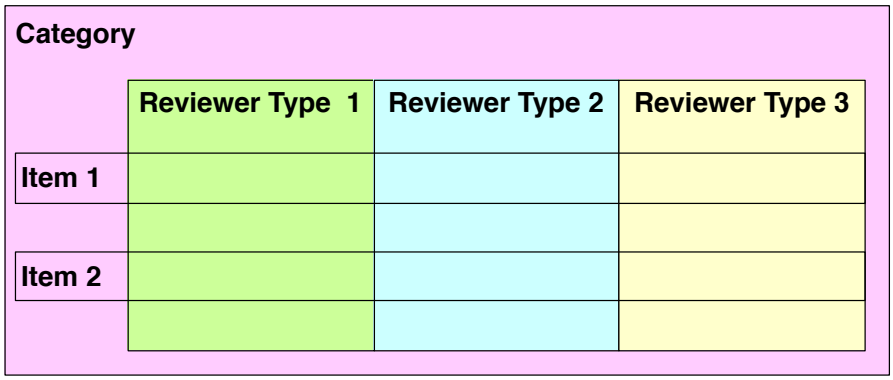

Figure 1: Relationship among category, item and reviewer type.

Note that reviewer types within a category are the same for all the items of the category. This is a direct consequence of the homogeneousness of the category: reviewer types – defined for the category – are naturally inherited by items.

Note that different categories are not required to be assessed by all the reviewer types, as shown in Figure 2, where “Category 1" is assessed by “Reviewer Type 1", “Reviewer Type 2" and “Reviewer Type 3" while “Category 2" is assessed just by “Reviewer Type 1" and “Reviewer Type 3".

This choice for representing the reality leads to a hierarchical way of scoring a supplier, since categories, reviewer types and items represent a different level of abstraction of the reality under examination. Thus it is opportune to exploit this intrinsic hierarchy using a weighted scoring scheme. This scoring scheme assigns different weights, i.e. different importance, to different levels in the hierarchy.

The scoring scheme is represented by means of the *evaluation matrix*, which is composed of the various categories of interest, which in turn are made up of different items, assessed by several reviewer types, as shown in Figure 3.

The final outcome of the evaluation matrix is the *supplier score*, as explained in section 3, which is computed as shown in Figure 3:

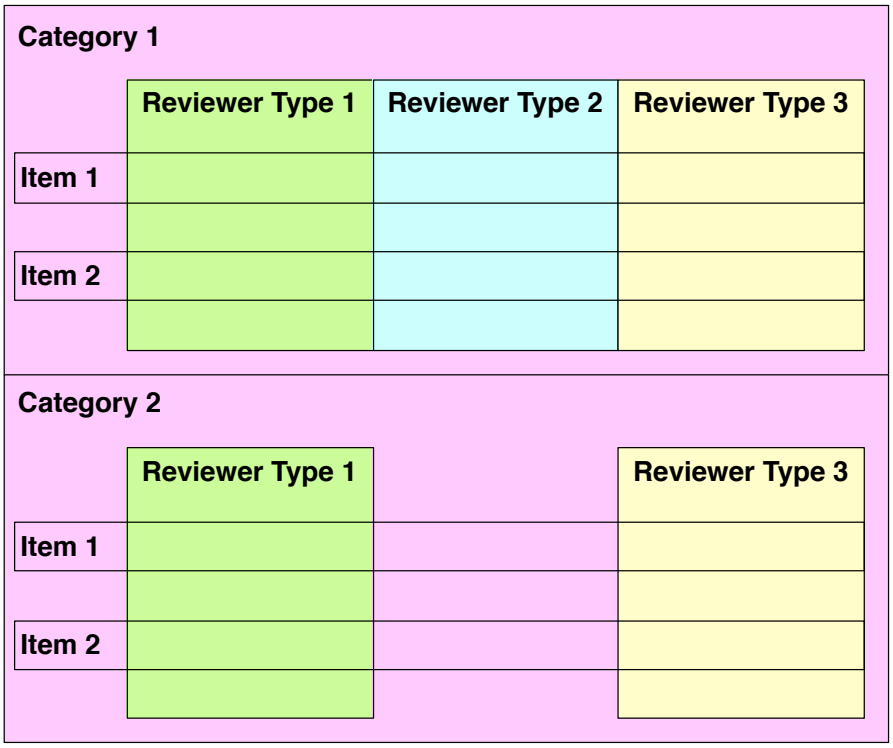

Figure 2: Categories with different reviewer types.

- *item score*: is the weighted sum of the *item sub–scores*, i.e. the scoring by a reviewer type of that item.
  In figure 3 the item sub–score is represented by a circle, and the item score by a hexagon;
- *category score*: is the weighted sum of the item scores for each item within that category.
  In figure 3 the category score is represented by a diamond;
- *supplier score*: is the weighted sum of the category scores for each category.
  In figure 3 the supplier score is represented with a sort of flag shaped figure.

The evaluation process is composed by the following steps:

1. definition of the reviewer types;
2. definition of the categories, their weights and the weights of their reviewer types;
3. definition of items and their respective weights;
4. scoring each item sub–score.

This procedure will be described in depth in Section 3 for the evaluation of the PREFORMA suppliers, which represents a relevant example of the application of the proposed method.

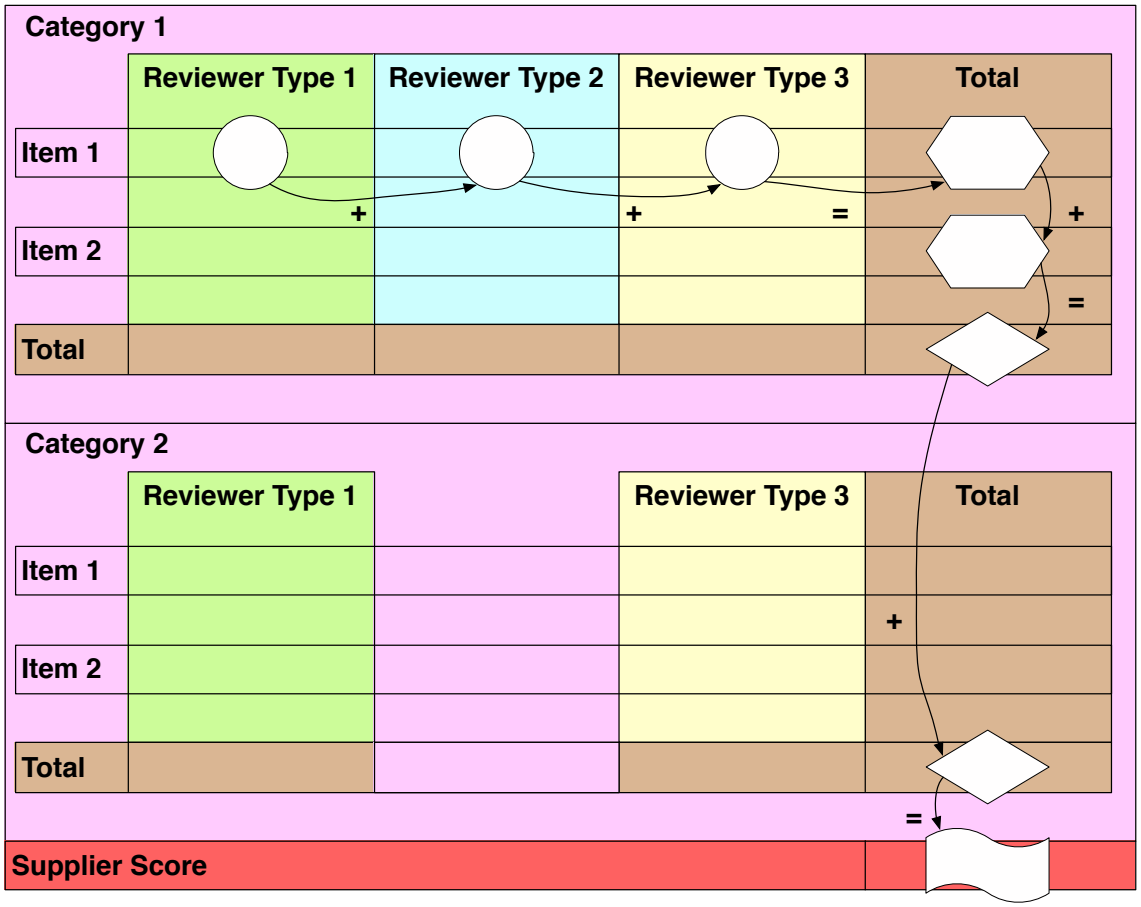

Figure 3: Basic functioning of the evaluation matrix.

2.1.1 Score Computation

We can describe the detailed procedure for computing the supplier score. Let us consider Figure 3 in reverse order thus beginning from the explanation of the category score.

- *The supplier score is a weighted sum of category scores*: if we call C_i the category score of the i-th category and α_i the coefficient expressing the weight of the i-th category, the supplier score is given by the equation (1),

$$\text{supplier score} = \alpha_1 C_1 + \alpha_2 C_2 + \ldots + \alpha_n C_n = \sum_{i=1}^{n} \alpha_i C_i \tag{1}$$

  where n is the total number of categories.
  Note that from now on the subscript i in the following equations stands for the i-th category.

- *The category score is a weighted sum of item scores*: if we call $I_{i,j}$ the score of the j-th item within the category C_i and $\beta_{i,j}$ the coefficient expressing the weight of the j-th item, the category score is given by equation (2),

$$C_i = \beta_{i,1} I_{i,1} + \beta_{i,2} I_{i,2} + \ldots + \beta_{i,k_i} I_{i,k_i} = \sum_{j=1}^{k_i} \beta_{i,j} I_{i,j} \tag{2}$$

  where k_i is the total number of items within the category C_i.

- *The item score is a weighted sum of item sub–scores*: In the context of the application of this evaluation method, that is the PREFORMA evaluation matrix presented in Section 3 we will need to consider categories with a maximum of three reviewer types. To simplify the notation, we tailor it to only three reviewer types; however, it could be easily extended to as many reviewer types as necessary.

  If we call $I'_{i,j}$, $I''_{i,j}$ and $I'''_{i,j}$ the item sub–scores for the generic item $I_{i,j}$ with respect to the first, second and third reviewer types, and we call γ'_i, γ''_i and γ'''_i the coefficients expressing the weight of the first, second and third reviewer type within the category C_i, the item score is given by equation (3).

$$I_{i,j} = \gamma'_i I'_{i,j} + \gamma''_i I''_{i,j} + \gamma'''_i I'''_{i,j} \tag{3}$$

It is generally understood that all the weighting coefficients α, β and γ are normalized to 1, as shown in equation (4). Besides being necessary for the correctness of computations, normalization allows us to easily compare scores of different items and different categories, gaining a quick overview of weak and strong points of a supplier.

$$\begin{aligned} &\alpha_1 + \alpha_2 + \ldots + \alpha_n = \sum_{i=1}^{n} \alpha_i = 1 \\ &\beta_{i,1} + \beta_{i,2} + \ldots + \beta_{i,k_i} = \sum_{j=1}^{k_i} \beta_{i,j} = 1, \quad \forall i \\ &\gamma'_i + \gamma''_i + \gamma'''_i = 1, \quad \forall i \end{aligned} \tag{4}$$

2.1.2 Scoring Model

The following is the item sub–score grading system, which ranges from 1 to 5:

- 1 – Bad
- 2 – Poor
- 3 – Fair

- 4 – Good
- 5 – Excellent.

Note that these values are consistent, for example, with the evaluation scale defined in Recommendation P.800 [ITU-T, 1996] by *Telecommunication Standardization Sector of ITU (ITU-T)*. The motivation of this choice is to render the evaluation matrix as close as possibile to international standardized evaluation methods, since the evaluation matrix should provide unbiased results taking into consideration different suppliers.

2.1.3 Reviewer Type Aggregation

For each reviewer type, the item sub–score can be the result of the scoring of a single or multiple reviewers of that type. In the latter case, we consider as aggregate item sub–score the average of the scores assigned by the reviewers.

Let $rt' \in [1, 2, \ldots]$ the number of reviewers of the first type, $rt'' \in [1, 2, \ldots]$ the number of reviewers of the second type, and $rt''' \in [1, 2, \ldots]$ the number of reviewers of the third type, then we have:

$$\boxed{\begin{aligned} I'_{i,j} &= \frac{1}{rt'} \sum_{k=1}^{rt'} I'^{(k)}_{i,j} \\ I''_{i,j} &= \frac{1}{rt''} \sum_{k=1}^{rt''} I''^{(k)}_{i,j} \\ I'''_{i,j} &= \frac{1}{rt''} \sum_{k=1}^{rt'''} I'''^{(k)}_{i,j} \end{aligned}} \tag{5}$$

where $I'^{(k)}_{i,j}$, $I''^{(k)}_{i,j}$, and $I'''^{(k)}_{i,j}$ are, respectively, the item sub–score assigned by the k-th reviewer of the first, second, and third type.

Note that, in general, rt', rt'', and rt''' can be different allowing for a further degree of flexibility. Indeed, you can decide to have the same number of reviewers for each reviewer type or you can decide to have different numbers of reviewers in each reviewer type if, for example, you need to make the assessment for a given reviewer type more stable.

2.1.4 Example of Use of the Evaluation Matrix

Now we introduce an example of use of the evaluation matrix, which is shown in Table 1.

Note that “Reviewer Type 2" and “Reviewer Type 3" are not present within “Category 1", so their respective weights γ'_1 and γ''_2 are equal to 0.

Taking into consideration Table 1, when you move horizontally within the evaluation matrix, you have to use the weights γ'_i, γ''_i and γ'''_i for adding scores. When you move vertically within a category, you have to use the weights $\beta_{i,j}$ for adding scores. Finally, when you move vertically among categories, you have to use the weights α_i for adding scores.

Supplier name: Vendor 1.				
	Reviewer Type 1	**Reviewer Type 2**	**Reviewer Type 3**	**Total**
Category 1 ($\alpha_1 = 0.3$)	$\gamma'_1 = 1$	$\gamma''_1 = 0$	$\gamma'''_1 = 0$	
Item 1 ($\beta_{1,1} = 0.4$)	3.00	–	–	3.00
Item 2 ($\beta_{1,2} = 0.6$)	4.00	–	–	4.00
Category 1 score	3.60	–	–	3.60
Category 2 ($\alpha_2 = 0.7$)	$\gamma'_2 = 0.4$	$\gamma''_2 = 0.3$	$\gamma'''_2 = 0.3$	
Item 1 ($\beta_{2,1} = 0.3$)	2.00	2.00	3.00	2.30
Item 2 ($\beta_{2,2} = 0.1$)	4.00	3.00	2.00	3.10
Item 3 ($\beta_{2,3} = 0.4$)	5.00	2.00	4.00	3.80
Item 4 ($\beta_{2,4} = 0.2$)	1.00	3.00	3.00	2.20
Category 2 score	3.20	2.30	3.30	2.96
Supplier Score				**3.15**

Table 1: Example of evaluation matrix.

Now we describe in detail how to obtain Table 1, using the computations described in section 2.1, figure 3 and section 2.1.1:

- the item score of “Item 1" of the category “Category 1", using equation (3), is given by:

$$I_{1,1} = \gamma'_1 I'_{1,1} + \gamma''_1 I''_{1,1} + \gamma'''_1 I'''_{1,1} = 1 \cdot 3.00 + 0 + 0 = 3.00$$

- the item score of “Item 2" of the category “Category 1", using equation (3), is given by:

$$I_{1,2} = \gamma'_1 I'_{1,2} + \gamma''_1 I''_{1,2} + \gamma'''_1 I'''_{1,2} = 1 \cdot 4.00 + 0 + 0 = 4.00$$

- the category score of the category “Category 1", using equation (2), is given by:

$$C_1 = \beta_{1,1} I_{1,1} + \beta_{1,2} I_{1,2} = 0.4 \cdot 3.00 + 0.6 \cdot 4.00 = 3.60$$

- the item score of “Item 1" of the category “Category 2", using equation (3), is given by:

$$I_{2,1} = \gamma'_2 I'_{2,1} + \gamma''_2 I''_{2,1} + \gamma'''_2 I'''_{2,1} = 0.4 \cdot 2.00 + 0.3 \cdot 2.00 + 0.3 \cdot 3.00 = 2.30$$

- the item score of “Item 2" of the category “Category 2", using equation (3), is given by:

$$I_{2,2} = \gamma'_2 I'_{2,2} + \gamma''_2 I''_{2,2} + \gamma'''_2 I'''_{2,2} = 0.4 \cdot 4.00 + 0.3 \cdot 3.00 + 0.3 \cdot 2.00 = 3.10$$

- the item score of “Item 3" of the category “Category 2", using equation (3), is given by:

$$I_{2,3} = \gamma'_2 I'_{2,3} + \gamma''_2 I''_{2,3} + \gamma'''_2 I'''_{2,3} = 0.4 \cdot 5.00 + 0.3 \cdot 2.00 + 0.3 \cdot 4.00 = 3.80$$

- the item score of “Item 4" of the category “Category 2", using equation (3), is given by:

$$I_{2,4} = \gamma'_2 I'_{2,4} + \gamma''_2 I''_{2,4} + \gamma'''_2 I'''_{2,4} = 0.4 \cdot 1.00 + 0.3 \cdot 3.00 + 0.3 \cdot 3.00 = 2.20$$

- the category score of the category “Category 2", using equation (2), is given by:

$$C_2 = \beta_{2,1} I_{2,1} + \beta_{2,2} I_{2,2} + \beta_{2,3} I_{2,3} + \beta_{2,4} I_{2,4} = 0.3 \cdot 2.30 + 0.1 \cdot 3.10 + 0.4 \cdot 3.80 + 0.2 \cdot 2.20 = 2.96$$

- the supplier score, using equation (1), is given by:

$$\text{supplier score} = \alpha_1 C_1 + \alpha_2 C_2 = 0.3 \cdot 3.60 + 0.7 \cdot 2.96 = 3.15$$

Note that these computations are the same of the process shown graphically in Figure 3.

2.1.5 Properties of the Evaluation Matrix

The evaluation matrix holds an useful property: it allows us to create groups of items within a category. This could be very useful in the case of categories with many items or in the case in which it is necessary to logically group items within a category.

For example table 1 could be reorganized grouping items in “Category 2", as shown in Table 2.

	Supplier name: Vendor 1.			
	Reviewer Type 1	**Reviewer Type 2**	**Reviewer Type 3**	**Total**
Category 1 ($\alpha_1 = 0.3$)	$\gamma'_1 = 1$	$\gamma''_1 = 0$	$\gamma'''_1 = 0$	
Item 1 ($\beta_{1,1} = 0.4$)	3.00	–	–	3.00
Item 2 ($\beta_{1,2} = 0.6$)	4.00	–	–	4.00
Category 1 score	3.60	–	–	3.60
Category 2 ($\alpha_2 = 0.7$)	$\gamma'_2 = 0.4$	$\gamma''_2 = 0.3$	$\gamma'''_2 = 0.3$	
GROUP 1				
Item 1 ($\beta_{2,1} = 0.3$)	2.00	2.00	3.00	2.30
Item 2 ($\beta_{2,2} = 0.1$)	4.00	3.00	2.00	3.10
TOTAL GROUP 1	1.00	0.90	1.10	1.00
GROUP 2				
Item 3 ($\beta_{2,3} = 0.4$)	5.00	2.00	4.00	3.80
Item 4 ($\beta_{2,4} = 0.2$)	1.00	3.00	3.00	2.20
TOTAL GROUP 2	2.20	1.40	2.20	1.96
Category 2 score	3.20	2.30	3.30	2.96
Supplier Score				**3.15**

Table 2: Evaluation matrix of table 1 organized with groups.

According to Table 2 the computation of C_2, which has been shown above, can be organized as follows:

$$C_2 = \underbrace{\beta_{2,1}I_{2,1} + \beta_{2,2}I_{2,2}}_{\text{GROUP 1}} + \underbrace{\beta_{2,3}I_{2,3} + \beta_{2,4}I_{2,4}}_{\text{GROUP 2}} =$$
$$= \underbrace{\left(0.3 \cdot 2.30 + 0.1 \cdot 3.10\right)}_{\text{GROUP 1 = 1.00}} + \underbrace{\left(0.4 \cdot 3.80 + 0.2 \cdot 2.20\right)}_{\text{GROUP 2 = 1.96}} =$$
$$= 1.00 + 1.96 = 2.96$$

This equation provides new information: the supplier “Vendor 1" is rated 1.00 in GROUP 1 of “Category 2" and 1.96 in GROUP 2 of “Category 2".

Thus this property of the evaluation matrix can be employed to summarize the content of a category into logical groups, hiding the detailed description of all the items within a category, as shown in Table 3.

	Supplier name: Vendor 1.			
	Reviewer Type 1	**Reviewer Type 2**	**Reviewer Type 3**	**Total**
Category 1 ($\alpha_1 = 0.3$)	$\gamma'_1 = 1$	$\gamma''_1 = 0$	$\gamma'''_1 = 0$	
Item 1 ($\beta_{1,1} = 0.4$)	3.00	–	–	3.00
Item 2 ($\beta_{1,2} = 0.6$)	4.00	–	–	4.00
Category 1 score	3.60	–	–	3.60
Category 2 ($\alpha_2 = 0.7$)	$\gamma'_2 = 0.4$	$\gamma''_2 = 0.3$	$\gamma'''_2 = 0.3$	
TOTAL GROUP 1	1.00	0.90	1.10	1.00
TOTAL GROUP 2	2.20	1.40	2.20	1.96
Category 2 score	3.20	2.30	3.30	2.96
Supplier Score				**3.15**

Table 3: Evaluation matrix of table 2 summarized by groups.

Note that creating groups within a category is as simple as putting parentheses in the weighted sum of the category score, as shown in the equation above.

Furthermore grouping items within a category can lead to additional and useful information: we can determine the weight of a subset of the items of the category.

For example, considering Table 2, we can see that:

$$\text{GROUP 1 WEIGHT} = \beta_{2,1} + \beta_{2,2} = 0.3 + 0.1 = 0.4$$
$$\text{GROUP 2 WEIGHT} = \beta_{2,3} + \beta_{2,3} = 0.4 + 0.2 = 0.6$$

We know that 40% of the score of “Category 2" is determined by “Group 1" and 60% of the score of “Category 2" is determined by “Group 1".

2.2 Comparison Process

The results of the evaluation matrix for each supplier is summarized by the **comparison matrix**, which offers a simple instrument for comparing different suppliers and choosing the best one.

In table 4 an example of comparison matrix is shown: the results are grouped according to category level.

	Supplier: Vendor 1	**Supplier: Vendor 2**
Category 1 Score $(\alpha_1 = 0.3)$	3.60	4.20
Category 2 Score $(\alpha_2 = 0.7)$	2.96	2.10
Total Supplier Score	**3.15**	**2.73**

Table 4: Example of comparison matrix with results grouped at category level.

If you need a greater level of detail, you can group results at group level, as shown in table 5.

	Supplier: Vendor 1	**Supplier: Vendor 2**
Category 1 Score $(\alpha_1 = 0.3)$	3.60	4.20
Category 2 $(\alpha_2 = 0.7)$		
TOTAL GROUP 1	1.00	0.90
TOTAL GROUP 2	1.96	1.20
Category 2 Score	2.96	2.10
Total Supplier Score	**3.15**	**2.73**

Table 5: Example of comparison matrix with results grouped at group level.

Obviously you can choose an even further level of detail, for example, showing the items of a category.

3 Design of the PREFORMA Evaluation Matrix

As explained in Section 2.1, designing the evaluation matrix involves the following steps:

1. defining reviewer types;
2. defining categories, their respective weights and the weights of reviewer types within each category;
3. defining items and their respective weights.

Figure 4 shows the main standpoints that need to be covered by the evaluation process.

We need to consider three reviewer types, which correspond to the three main stakeholders involved in the PREFORMA project, as shown in Figure 4. They are:

- **Technical Expert**: the proposed solution is analyzed by a technical expert, who is evaluating the solution from the technical point-of-view;
- **Domain Expert**: the proposed solution is analyzed by a domain expert, who verifies if the solution well fits the requirement of the domain where it will be used;

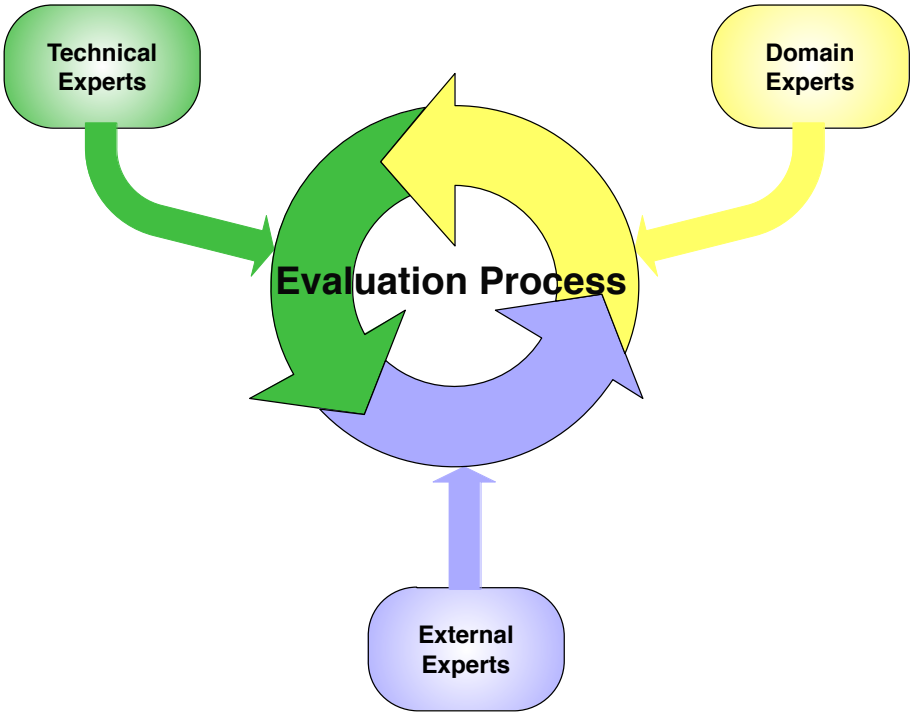

Figure 4: Angles covered by the evaluation process.

- **External Expert**: the proposed solution is analyzed by an expert external to the PREFORMA consortium, to compensate for any possible biases.

In particular, each supplier solution will be reviewed by the following number of reviewers for each reviewer type:

- **Technical Expert**: 2 reviewers for each proposal, i.e. $rt' = 2$;
- **Domain Expert**: 3 reviewers for each proposal, i.e. $rt'' = 3$;
- **External Expert**: 1 reviewer for each proposal, i.e. $rt''' = 1$;

The following is a detailed description of all the categories and all the items for each category is presented. Each category is specified by:

- name;
- brief description;
- weight of the category;
- weights of the different reviewer types within the category;

- complete list of all the items of the category.
  Each item is specified by:
  - name;
  - brief description;
  - meaning of the scores for that item;
  - weight of the item.

3.1 Impact on the Challenge

3.1.1 Description

The category “Impact On the Challenge" concerns the extent of how well the proposed idea, solution or technology meets the challenge as detailed in the Brief, and whether it will have the desired impact.

This category pertains all three reviewer types.

The following parameters are valid for the category:

- Category C_1 – IMPACT ON THE CHALLENGE
- *Category weight*: $\alpha_1 = 35\%$
  This category evaluates the extent to which the proposed solution meets the challenge.
- *Reviewer Type weights*:
  - *“Technical Expert" reviewer type weight*: $\gamma_1' = 30\%$
  - *“Domain Expert" reviewer type weight*: $\gamma_1'' = 40\%$
  - *“External Expert" reviewer type weight*: $\gamma_1''' = 30\%$

3.1.2 Items

- Item $I_{1,1}$ – **Basic research questions**
  - *description*: This item concerns: (i) how to interpret and implement standard specifications; (ii) how to determine whether a file is what it claims to be; and (iii) how to make OS project sustainable.
    In order to evaluate the aspect (i) the reviewer has to consider if the project establishes a methodology or an objective frame of reference to interpret and implement the standard specifications against the background of the current variations of interpretations and implementations by software vendors and if there is a need to consolidate the diverse implementations or if it is a better to centralize the interpretation to a specific implementation (i.e. promote one interpretation and implementation as the standard).
    In order to evaluate the aspect (ii) the reviewer has to determine whether a file is what it claims to be, i.e., in this context, what makes a file a valid file, or is it conform to the

"standard"?
In order to evaluate the aspect (iii) the reviewer has to consider how the open source project can be developed and sustained in the short and long run and if an open source community can operate as the normative source for the answer to the first and second question.

- *item weight*: $\beta_{1,1} = 10\%$

- Item $I_{1,2}$ – **Conformance Checker**
  - *description*: This item concerns the conformance checker and it contains some general aspects and some aspects which are specific of the file type the checker is operating with.
    For evaluating the general aspects the reviewer has to consider: (i) if the project develops an open-source conformance checker; (ii) if the conformance checker enables implementation of the OAIS Quality assurance function at Ingest, validating (QA results) the successful transfer of the SIP to the temporary storage area; (iii) if the conformance checker enables implementation of the OAIS Generate AIP function at ingest, transforming one or more SIPs into one or more AIPs that conform to the archive's data formatting standards and documentation standards; (vi) if the conformance checker enables implementation of the OAIS Archival Information Update function at ingest, providing a mechanism for updating (repackaging, transformation) the contents of the archive.
    For evaluating the file type specific aspects the reviewer has to consider: (PDF/A) if basic research activities involve checking for the existence of PDF/A functionalities and if they are implemented in accordance with the specifications for PDF/A; (TIFF) if basic research activities involve checking for the existence of TIFF functionalities and if they are implemented in accordance with the specifications for TIFF; (AV) if basic research activities involve the definition of a profile for an audiovisual preservation file.
    The conformance checker would be used to evaluate and if possible fix a SIP and convert it into an AIP. Practically this would mean: Your repository receives an exotic TIFF or PDF file and convert it into a TIFF/A or PDF/A file, not by transcoding the file, but by stripping/adding/editing information in the header and the structure of the file. This was how we conceived the Generate AIP function in the OAIS model.
    As for evaluating the use of OAIS as a reference framework, "enable" refers meeting the technical requirements for integrating the conformance checker in existing workflows and designing a shell that allows for performing essential tasks that fit the OAIS framework. So for example Generate OAIS requires a machine readable report that can be used by a transcoder to convert the file. Or when small errors are concerned, the fixer module should be able to perform the conversion.
  - *item weight*: $\beta_{1,2} = 20\%$

- Item $I_{1,3}$ – **Reference Implementation**

- *description*: This item considers many aspects of the reference architecture of the proposed solutions. The aspects that need to be evaluated by the reviewer are:
  (i) healthy ecosystem: the project establish a healthy ecosystem around an open source 'reference' implementation for specific file formats;
  (ii) demonstration files: technology providers contribute demonstration files with good and bad samples of the corresponding reference implementation;
  (iii) documentation of the source code: technology providers contribute comprehensive documentation of the source code, which allows for automated generation of the internal API of the application;
  (iv) documentation of the software: technology providers contribute comprehensive documentation of the conformance checker for developers, such as quick start guide, cookbooks and other tutorials;
  (v) online technical support: technology providers ensure online availability at the development platform for technical support to other developers deploying the conformance checker;
  (vi) marketing at conferences: technology providers market the reference implementation and conformance checker at conference for professional networks of developers and digital preservationists;
  (vii) propose changes and additions: technology providers draft proposals for changes and additions to the standard specifications;
  (viii) participate in work-groups: technology providers participate in technical workgroups that maintain a standard specification;
  (ix) facilitate OAIS Monitor Designated Communities: the network of common interest enables implementation of the OAIS Monitor Designated Communities function for Preservation Planning, interacting with Archive Consumers and Producers to track changes in their service requirements and available product technologies;
  (x) facilitate OAIS Develop Preservation Strategies and Standards: the network of common interest enables implementation of the OAIS Develop Preservation Strategies and Standards function for preservation planning, developing and recommending strategies and standards, and for assessing risks, to enable the Archive to make informed trade-offs as it establishes standards, sets policies, and manages its system infrastructure;
  (xi) facilitate OAIS Establishing Standards and Policies: the network of common interest enables implementation of the OAIS Establishing Standards and Policies function by the Administration of the Archive system and maintain them.
- *item weight*: $\beta_{1,3} = 20\%$

- Item $I_{1,4}$ – **Future/wider challenges/future proof**
  - *description*: The reviewer has to evaluate the potential of the proposal to address future/wider challenges in the area in an innovative way (e.g. by developing or employing novel concepts, approaches, methodologies, tools, or technologies).
  - *item weight*: $\beta_{1,4} = 5\%$

- Item $I_{1,5}$ – **Commercial feasibility**
  - *description*: The reviewer has to evaluate the extent to which the approach demonstrates commercial feasibility, and whether it is a realistic commercialization plan or route to market; in particular it has to be considered the following aspects: (i) integration with text, image, moving image editors; (ii) integration with digital repositories; (iii) integration with transcoding software; (iv) integration of additional conformance checkers; (v) integration of additional reporters; (vi) providing consulting services; (vii) providing customization services; (viii) providing support services.
  - *item weight*: $\beta_{1,5} = 15\%$

- Item $I_{1,6}$ – **Open source work practices**
  - *description*: The reviewer has to evaluate this item considering that the development of software in open source projects in PREFORMA must utilise effective open source work practices.
    In particular it has to be considered the following aspects: (i) nigthly builds; (ii) open development platform; (iii) issue/bug trackers; (iv) developer communication channels (e.g. use of forums, use of mailing lists for different stakeholder groups (users, developers, etc.) and use of IRC, provision of roadmaps, provision of documentation, provision of easy hacks, etc.).
  - *item weight*: $\beta_{1,6} = 5\%$

- Item $I_{1,7}$ – **Open Source release practice / Delivery and installation**
  - *description*: This category concerns aspects regarding the delivery and installation of a system.
    In particular it has to be considered the following aspects: (i) executable source code: for each executable of developed software that is provided in an open source project, the source code must always be provided for that executable.;
    (ii) instructions for making executables: for each executable of developed software that are provided in an open source project, instructions for how to create the executable from the source code must always be provided;
    (iii) open source tools for making executables: for each executable of developed software that are provided in an open source project at the PREFORMA open source portal, open source tools (provided under any license approved by Open Source Initiative) for creation of the executable from the source code must be provided;
    (iv) executables for multiple platforms: there must always be executables for several different platforms (at least for: MS Windows 7, Mac OSX, common Linux distributions such as Ubuntu, Fedora, Debian, and Suse).

  - *item weight*: $\beta_{1,7} = 10\%$

- Item $I_{1,8}$ – **Open Source interaction practice**
  - *description*: Individuals in companies contracted by PREFORMA will adopt a work-practice which promote a diverse long-term sustainable Open Source community (which have active participants and contributors from several different organisations).
    In particular it has to be considered the following aspects: (i) engage in timely fashion: companies contracted by PREFORMA for development and provision of software and associated digital assets in Open Source projects must be responsive with respect to contributions to the project and are expected to engage in activities in a timely fashion;
    (ii) open collaboration: companies contracted by PREFORMA for development and provision of software and associated digital assets in Open Source projects must be responsive with respect to contributions to the project and are expected to promote an open collaboration and become active community members which adhere to established community values and work-practices;
    (iii) promote external contribution: companies contracted by PREFORMA for development and provision of software and associated digital assets in Open Source projects must be responsive with respect to contributions to the project and are expected to promote external contributions to each Open Source project;
    (iv) contribute to other projects: companies contracted by PREFORMA for development and provision of software and associated digital assets in Open Source projects must be responsive with respect to contributions to the project and are expected to be active contributors in other relevant Open Source projects that are related to the Open Source project for which they are contracted;
    (v) interact with standardisation organisations: the open source projects conducting development of software for PREFORMA must actively engage in interacting with relevant organisations that maintain the standard specifications used by the open project. The aim is to provide feedback, resolve technical issues;
    (vi) interact with software providers: the open source projects conducting development of software for PREFORMA must actively engage in interacting with relevant software providers (i.e. those providers which have developed software used for creation of files in the specific file format checked by the PREFORMA software) for provision of feedback, resolving technical issues, and contribute in a dialogue for improvement of their interpretation of the technical specifications of standards implemented in their software;
    (vii) respect of the negotiation protocol.
  - *item weight*: $\beta_{1,8} = 10\%$

- Item $I_{1,9}$ – **Open Source IPR distribution**
  - *description*: This category has to be evaluated by considering the following aspects:
    (i) software and source code: “GPLv3 or later” and “MPLv2 or later”: all software de-

veloped during the PREFORMA project must be provided under the two specific open source licenses: “GPLv3 or later” and “MPLv2 or later”;
(ii) open formats EIFv1.0/open standards: All digital assets developed during the PREFORMA project must be provided in open file formats, i.e. an open standard as defined in the European Interoperability Framework for Pan-European eGovernment Service (version 1.0 2004). This item concerns the degree of proprietary solution, i.e. if the system uses an open standard solution or a proprietary solutions;
(iii) CC-BYv4.0: all digital assets developed during the PREFORMA project must be provided under the open access license: Creative Commons CC-BY v4.0; (vii) respect of the negotiation protocol.

- *item weight*: $\beta_{1,9} = 5\%$

3.2 Technical Approach

3.2.1 Description

This category regards all the technical aspects concerning the proposal.
The following parameters are valid for the category:

- Category C_2 – TECHNICAL APPROACH
- *Category weight*: $\alpha_2 = 35\%$
  This category evaluates the technical quality of the proposal.
- *Reviewer Type weights*:
  - *“Technical Expert" reviewer type weight*: $\gamma_2' = 50\%$
  - *“Domain Expert" reviewer type weight*: $\gamma_2'' = 20\%$
  - *“External Expert" reviewer type weight*: $\gamma_2''' = 30\%$

3.2.2 Items

- Item $I_{2,1}$ – **Architecture**
  - *description*: This item concerns infrastructural aspects, technical specifications and system features of a system. In particular it has to be evaluated by considering:
    (i) Interoperability: this item concerns the degree at which the solution can interoperate with other components and solutions;
    (ii) Scalability: this item concerns the degree at which the solution is scalable and expansible;
    (iii) Portability: source code must be built for portability between technical deployment platforms (platform independent);
    (iv) Modularity: source code must be built in a modular fashion for improved maintainability;

(v) Deployment: the Conformance Checker must allow for deployment in the five infrastructures/ environments defined in the Challenge Brief, i.c. PREFORMA website, stand alone, networked, in legacy system and in test environment;
(vi) Interface: the Conformance Checker must interface with other software systems via APIs;

- *item weight*: $\beta_{2,1} = 30\%$

- Item $I_{2,2}$ – **Performances and Quality**
  - *description*: The goal of this item is to evaluate the general performances and the quality, which are measured from both an objective and a subjective point of view.
  - *item weight*: $\beta_{2,2} = 10\%$

- Item $I_{2,3}$ – **Shell Services and features**
  - *description*: This item concerns functionalities and services offered by a system. It has to be evaluated by considering:

    (i) checking at creation time: the Shell component of the Conformance Checker must facilitate conformance checking of files at four moment in the life cycle of a digital document, identified in the use cases of the challenge brief, including conformance checking at creation time, transfer time, digitisation time and migration time;
    (ii) checking at transfer time: The Shell component of the Conformance Checker must facilitate conformance checking of files at four moment in the life cycle of a digital document, identified in the use cases of the challenge brief, including conformance checking at creation time, transfer time, digitisation time and migration time; (iii) checking at digitisation time: The Shell component of the Conformance Checker must facilitate conformance checking of files at four moment in the life cycle of a digital document, identified in the use cases of the challenge brief, including conformance checking at creation time, transfer time, digitisation time and migration time;
    (iv) checking at migration time: The Shell component of the Conformance Checker must facilitate conformance checking of files at four moment in the life cycle of a digital document, identified in the use cases of the challenge brief, including conformance checking at creation time, transfer time, digitisation time and migration time;
    (v) automated checks: The Shell component of the Conformance Checker must allow for automating the procedures for checking, reporting and fixing preservation file;
    (vi) periodical checks: The Shell component of the Conformance Checker must allow for configuring fully automated, periodical checks;
    (vii) batch processing: The Shell component of the Conformance Checker must allow for batch processing of extensive file sets;

(viii) addotopma: The Shell component of the Conformance Checker must allow for configuration of additional components in particular implementation checkers, policy checkers and reporters for other preservation file formats that are developed in the PREFORMA ecosystem;
(ix) use by non-expert users: The Shell component of the Conformance Checker must allow for use by non-expert users;
(x) operate without Internet: The Shell component of the Conformance Checker must be operational in a closed zone with no Internet access.

- *item weight*: $\beta_{2,3} = 30\%$

- Item $I_{2,4}$ – **Implementation Checker Services and features**
  - *description*: This item has to be evaluated following different criteria on the basis of the file type the checker is designed for.
    For text the checker has to test the compliancy of: PDF 1.4 (PDF/A-1) [ISO 19005-1, 2005], PDF 1.7 [ISO 32000-1, 2008], PDF/A-2 [ISO 19005-2, 2011] and PDF/A-3 [ISO 19005-3, 2012].
    For images the checker has to test the compliancy of: TIFF/EP [ISO 12234-2, 2001] and TIFF/IT [ISO 12639, 2004].
    For Audio/video the checker has to test the compliancy of: MKV, OGG, Lossless JPEG2000 [ISO/IEC 15444, 2004], Lossless FFV1 and LPCM [IEC 60958, 2014].
  - *item weight*: $\beta_{2,4} = 10\%$

- Item $I_{2,5}$ – **Policy Checker Services and features**
  - *description*: This item has to be evaluated by considering technical metadata for text, technical metadata for image and technical metadata for av.
  - *item weight*: $\beta_{2,5} = 5\%$

- Item $I_{2,6}$ – **Reporter Services and features**
  - *description*: This item has to be evaluated by considering if the checker produces both machine readable report and human readable report.
    Machine readable report must provide preservation metadata for each file checked and allowing external software agents to further process the file. The machine readable report will be produced using a standard XML format, implemented by all conformance checkers in the PREFORMA ecosystem, which allows the reported module to combine output from multiple checker components in one report.
    Human readable report must provide a human readable report, assessing the preservation status of a batch of files as a whole, reporting to a non-expert audience whether a file is compliant with the standard specifications, and addressing improvements in the creation/digitisation process.

- *item weight*: $\beta_{2,6} = 10\%$

- Item $I_{2,7}$ – **Metadata fixer Services and features**
  - *description*: This item has to be evaluated by considering if the checker:
    (i) aligns embedded metadata: The Metadata fixer component of the Conformance Checker must allow for performing fully automated fixes of incongruities in the metadata embedded in the file, based on the report of the implementation checker. Such automated fixes may include making embedded technical metadata conform with the properties of video and audio essence contained by the preservation file;
    (ii) essences normalising metadata: The Metadata fixer component of the Conformance Checker must allow for performing fully automated fixes of incongruities in the metadata embedded in the file, based on the report of the implementation checker. Such automated fixes may include normalising embedded administrative metadata about the preservation file.
  - *item weight*: $\beta_{2,7} = 5\%$

3.3 Quality of the Tender

3.3.1 Description

This category deal with all the aspects related to project management and how the negotiation protocol has been taken into account.

The following parameters are valid for the category:

- Category C_3 – QUALITY OF THE TENDER
- *Category weight*: $\alpha_3 = 15\%$
  This category deal with all the aspects related to project management and how the negotiation protocol has been taken into account.
- *Reviewer Type weights*:
  - *"Technical Expert" reviewer type weight*: $\gamma_3' = 35\%$
  - *"Domain Expert" reviewer type weight*: $\gamma_3'' = 35\%$
  - *"External Expert" reviewer type weight*: $\gamma_3''' = 30\%$

3.3.2 Items

- Item $I_{3,1}$ – **Project plan**
  - *description*: This item evaluates the extent to which the tender shows a clear plan for the development of a working solution, and whether it is a reasonable plan to finish phase 3 in time. It must be verified if the proposal respects of the negotiation protocol.

  - *item weight*: $\beta_{3,1} = 15\%$

- Item $I_{3,2}$ – **Effectiveness management**
  - *description*: This item evaluates the effectiveness of the management.
  - *item weight*: $\beta_{3,2} = 15\%$

- Item $I_{3,3}$ – **Resource allocation**
  - *description*: The extent to which the tenderer and/or subcontractor appear to have dedicated the resources (e.g. human capital, equipment etc.) necessary to perform the scope of the tender. It must be verified if the proposal respects of the negotiation protocol.
  - *item weight*: $\beta_{3,3} = 15\%$

- Item $I_{3,4}$ – **Risk Assessment / Risk factors**
  - *description*: The extent to which crucial risks (technical, commercial and other) to project success appear to be identified, and how effectively these will be managed. this item concerns the riskiness of a system and the acceptance of these risks.
  - *item weight*: $\beta_{3,4} = 15\%$

- Item $I_{3,5}$ – **Negotiation Protocol**
  - *description*: The extent to which the recommendations expressed in the negotiation protocol (see Appendix A) have been implemented in the project.
  - *item weight*: $\beta_{3,5} = 40\%$

3.4 Costs

3.4.1 Description

This category concerns the financial aspects of a supplier.

- Category C_4 – COSTS
- *Category weight*: $\alpha_4 = 15\%$
  This category concerns the financial aspects of a supplier.
- *Reviewer Type weights*:
  - *"Technical Expert" reviewer type weight*: $\gamma_3' = 35\%$
  - *"Domain Expert" reviewer type weight*: $\gamma_3'' = 35\%$
  - *"External Expert" reviewer type weight*: $\gamma_3''' = 30\%$

3.4.2 Items

- Item $I_{4,1}$ – **Price/cost**
  - *item weight*: $\beta_{4,1} = 100\%$

3.5 Overall Considerations

In figure 5, the distribution of category weights α_i is shown.
You can notice that:

- the first two categories, i.e. “Impact on the Challenge" and “Technical Approach" determine 70% of the supplier score. In fact these categories together constitute the core aspects of a solution;
- both the categories “Quality of the Tender" and “Costs" determine 30% of the supplier score, in order to give the possibility of trading-off the impact on the challenge and the technical approach with other important factors.

In figure 6, the distribution of reviewer types weights γ_i is shown.
Figure 6 gives an overview of the reviewer type weights, and you can notice that:

- *external experts* always account for a 30% of the score in order to compensate any possible bias and ensure a fair evaluation;
- *technical experts* determine 50% of the score for the “Technical Approach" category, where they are the most entitled to evaluate while they have the same weight of the domain experts when it comes to the “Quality of the Tender" and “Costs" categories;
- *domain experts* determine 40% of the score for the “Impact on the Challenge" category since they are the actual stakeholders of the solutions proposed by the suppliers.

4 Conclusions

This deliverable described the competitive evaluation strategy and its scoring model.

As far as the overall evaluation procedure of the first design phase is concerned (art. 1.2 of Framework Agreement), it will follow the same lines adopted for the evaluation of the PREFORMA tenders as described in [Lemmens et al., 2014] and here summarized:

1. individual evaluation phase by each type of expert;
2. consensus meeting among reviewers;
3. final ranking by the whole evaluation committee;
4. negotiation meeting with top ranked suppliers in order clarify any leftover doubts and/or adjust costs to the available budget.

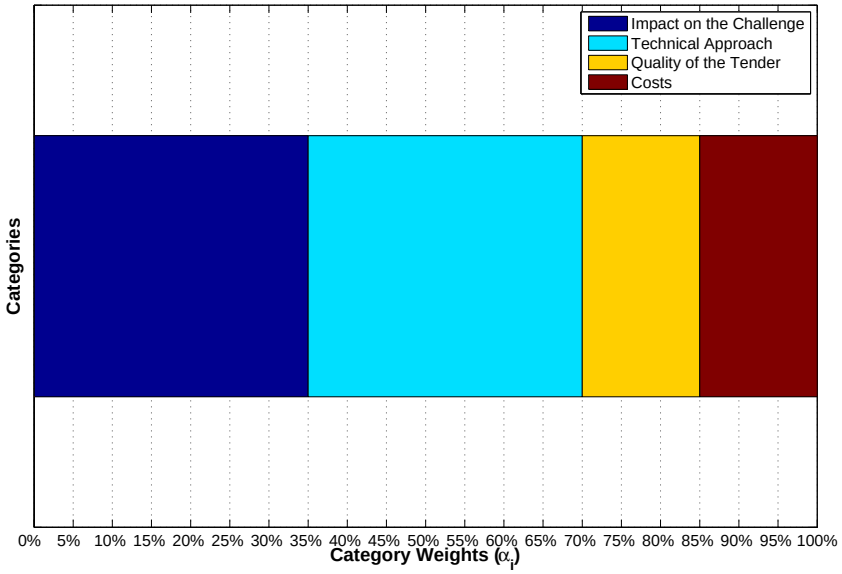

Figure 5: Category weights comparison.

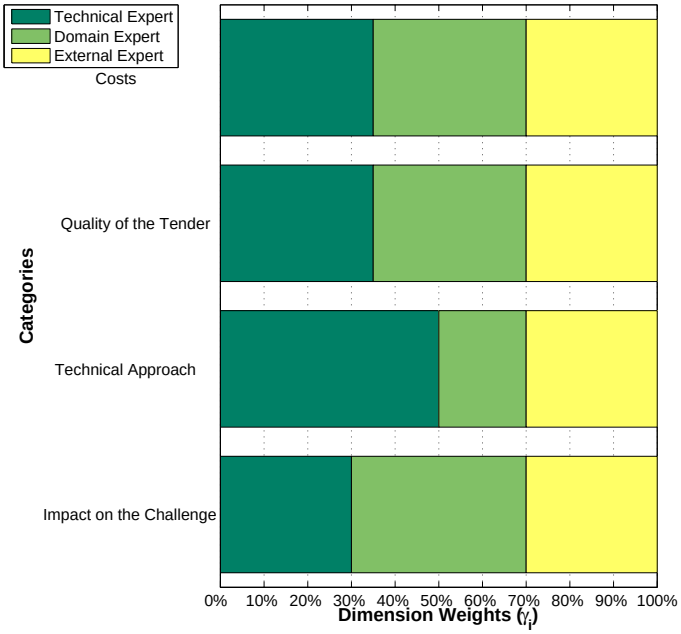

Figure 6: Dimensions weights comparison among categories.

References

IEC 60958 (2014). Digital audio interface - Part 1: General. Standard IEC 60958-1 Ed. 3.1 b:2014.

ISO 12234-2 (2001). Electronic still-picture imaging – Removable memory – Part 2: TIFF/EP image data format. Recommendation ISO 12234-2:2001.

ISO 12639 (2004). Graphic technology – Prepress digital data exchange – Tag image file format for image technology (TIFF/IT). Recommendation ISO 12639:2004.

ISO 19005-1 (2005). Document management – Electronic document file format for long-term preservation – Part 1: Use of PDF 1.4 (PDF/A-1). Recommendation ISO 19005-1:2005.

ISO 19005-2 (2011). Document management – Electronic document file format for long-term preservation – Part 2: Use of ISO 32000-1 (PDF/A-2). Recommendation ISO 19005-2:2011.

ISO 19005-3 (2012). Document management – Electronic document file format for long-term preservation – Part 3: Use of ISO 32000-1 with support for embedded files (PDF/A-3). Recommendation ISO 19005-3:2012.

ISO 32000-1 (2008). Document management – Portable document format – Part 1: PDF 1.7. Recommendation ISO 32000-1:2008.

ISO/IEC 15444 (2004). Information technology – JPEG 2000 image coding system: Core coding system. Recommendation ISO/IEC 15444-1:2004.

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A Negotiation Protocol [Confidential]

A.1 Easy Innova

The objective of this negotiation protocol is to formally clarify the possible incongruities which the evaluation committee has identified between the DPF Manager for TIFF proposal and the requirements of the Invitation to Tender and the Challenge Brief and agree on how these issues must be addressed in Phase I of the PREFORMA project.

This formal clarification seeks:

- to ensure that the Contractor has fully understood the issues raised by the Evaluation Committee

- to obtain the commitment of the Contractor to research the issues as agreed in the negotiation,
- to obtain the commitment of the Contractor to resolve the issues as agreed in the negotiation,
- to dedicate the responsibility to perform the R&D in line with the requirements of the ITT and the Challenge Brief to the Contractor

Some of the issues listed below have already been discussed through the requests for clarification and the hearing. For the sake of completeness, we have included a report of the discussion so far.

Next four issues raised by the Evaluation Committee should be clarified and agreed upon by the Contractor.

A.1.1 Demonstrate You Are in Possession of All Necessary Rights

The Evaluation Committee expressed the concern that the patent claims on the ISO 12234-2 TIFF/EP specification may complicate the IPR model set forth in the Invitation to Tender.

The TIFF/EP file format has been put forward by the PREFORMA Consortium as one of targets for the PREFORMA Project, based on the concern that memory institutions in practice have to deal with a wide variety of TIFF implementations. The TIFF/EP standard contains the core TIFF 6.0 specifications that aim for maximum interoperability of TIFF files, as well as a broad set of specifications for managing 'raw' image information and technical metadata.

One of the main objectives of the PREFORMA project is to establish a reference implementation for TIFF for which software can be implemented under royalty free conditions.

The Evaluation Committee is aware that Adobe Systems refers to the TIFF 6.0 Specification as a 'public domain raster file format, while the published specification remains under control of Adobe Systems.

The Evaluation Committee is aware that the ISO 12234-2 TIFF/EP specification and the ISO patent database contain references to 17 organisations which declare they control patents that have an impact on parts of the TIFF/EP specification.

Hence, it is not an open standard according to EIFv1, because the intellectual property of the standard is not made irrevocably free on a royalty-free basis.

The Evaluation Committee considers clarifying to which extent the claims of these 17 organisations represent a concrete risk for implementation of the TIFF/EP under royalty free conditions as a vital part of the DPF Manager for TIFF project.

Hence, the Evaluation Committee expects that EasyInnova can formally demonstrate that it has obtained all necessary rights from all organisations that control one (or several) patent(s) (and other IP) which impact on the technical specifications of TIFF/EP), either by:

1. sending us a copy of all license agreements you have signed,
2. sending us a copy of all license agreements you have been offered,
3. sending us a copy of all explicit declarations that the intellectual property of (parts of) the standard is made irrevocably available on a royalty-free basis, or

4. by formally describing the workaround for implementing licensed parts of the standard.

Patent claims from the following list of organisations, listed in the ISO 12234-2 specification and patent database should be considered:

1. Adobe Systems
2. FUJIFILM Corporation
3. Tokyo Electron Device Ltd. - TED
4. Sharp Corporation - IP Group
5. Sanyo Electric Co., Ltd.
6. Matsushita Electric Industrial Co., Ltd.
7. Konica Minolta Holdings, Inc. - IP Center
8. Canon Inc. Headquarters
9. Minolta Co., Ltd.
10. Olympus Optical Co. Ltd.
11. Hitachi, Ltd
12. Photography
13. Toshiba Corporation
14. Kyocera Corporation - Patent Department
15. Ricoh Company, Ltd. - Tokyo
16. NEC Corporation
17. FUJIFILM Corporation

In reply to this request for clarification on 23/10/2014, you have stated: The aim of the conformance checker is a validation test of TIFF data packages dedicated for digital archiving. Therefore it is important to distinguish between,

1) analysis of TIFF data packages

2) identification of content (color space, compression, metadata, É) that is not appropriate for digital archiving

and,

3) Transformation of any data content (color space, compression, metadata, É).

1) and 2) are part of the functionality of the conformance checker. Before ingest in an archival infrastructure the checker is reading TIFF image data and validating the data structure. Therefore,

tags are parsed and checked if they conform to the latest TIFF standard. No data is modified or changed in such a process. As a main result, the files are labelled as “ready for ingest" or “not appropriate for ingest because ofÉ". Due to the fact that no modifications are done, no license agreements with the patent holders are necessary. 1) and 2) are read only workflows!

3) is not a part of this project proposal, because no data content will be changed or modified. CFA coded image data is not decoded, nor is any thumbnail information stored in a proprietary way read. This means the inner structure of the files, tags or any data will not be modified, nor is any proprietary coded software decoded.

We have deeply analysed patent claims over TIFF/EP ISO 12234-2 standard. Attached to this document you can find the conclusions of our research (see file Patent_claim_analysis_over_ISO12234-2-v1.2.pdf). As a result we can say that we do not make use of any code or implementation details of any of the mentioned patents held by one or more of the companies mentioned.

Based on fundamental archival strategies it even can be said that any file that contains content protected by a patent is not valid for archival purposes and therefore has to be rejected by the conformance checker.

A.1.2 Adherence to License Requirements for the Software Developed and Used in the PREFORMA Project

The Evaluation Committee expressed the concern that the license policy as described in the DPF Manager for TIFF proposal (cf. “GPL v3 and MPLv2") is not fully compliant with the license model required by the Invitation to Tender.

PREFORMA has minimum requirements concerning use of two specific Open Source licenses, i.e. "GPLv3 or later" and "MPLv2 or later" for all software developed and used.

The choice of "GPLv3 or later" will minimise risks for memory institutions. If a file format is provided under conditions which imply that it can be implemented in a software system and provided (on an open platform) under the "GPLv3 or later" license, the PREFORMA consortium minimise the (legal) risk for not being able to use, evolve and redistribute the software over very long life-cycles.

The choice of "MPLv2 or later" allows memory institutions full flexibility in terms of integration of developed software with their legacy systems, something which may become an issue if the PREFORMA project would only have selected the "GPLv3 or later" alternative.

This is in contrast with several permissive Open Source licenses (e.g. BSD which lacks patent clauses) and such would expose memory institutions to significant legal risks related to patent infringements and thereby no protection against legal threats.

This choice is based on extensive prior research and for PREFORMA this is important for a number of reasons (including: a future proof software; licensing issues to allow integration and distribution; sustainability of communities; legal protection for memory institutions; etc.). In order to clarify the licensing conditions for software, as expressed in Section 5.1 of the Invitation to Tender, you need to confirm that you intend to meet the minimum requirements for licensing of all software developed and used in PREFORMA.

The term "developed" refers to both:

(1) development for new code for the DPF Manager for TIFF conformance checker,

(2) contributions to third party software under the same licenses that is used in the DPF Manager for TIFF conformance checker. E.g. when utilising open source work practices developers typically contribute bug fixes (perhaps a few lines of code) to an existing.

The term “used" refers to both:

(3) use of a third party Open Source project in the DPF Manager for TIFF conformance checker to perform its function,

(4) software used to develop, maintain, test and operate the DPF Manager for TIFF project as a whole i.c. software for developing and maintaining the source code of the DPF Manager for TIFF conformance checker, testing the DPF Manager for TIFF conformance checker and managing the open source community. .

The Evaluation Committee expects that:

(1) new code developed for the DPF Manager for TIFF conformance checker

(2) contributions to third party software used in the DPF Manager for TIFF conformance checker to perform its function, and

(3) third party software used in the DPF Manager for TIFF conformance checker to perform its function, must all be licensed under both "GPLv3 or later" and "MPLv2 or later".

Hence (4) software used to develop, maintain, test and operate the DPF Manager for TIFF project as a whole should be licensed under a generally recognized open source software license, compatible with the license granted under the Agreement (cf. par. 17.5 of the Framework Agreement).

The Evaluation Committee expects that the environment for building the code is open source. Hence, source code can hosted using common and freely available third-party platforms (e.g. GitHub, GoogleCode), although these platforms are not necessarily open source.

Furthermore, the Evaluation Committee does not expect software for creating test files to be available under specific Open source licenses and acknowledges that the corpus of test files to be used for testing the DPF Manager for TIFF conformance checker preferably originates from a wide range of producing software.

In the reply to the Request for Clarification, you stated that “*all software developed and used will be licensed under these two specific Open Source licenses ("GPLv3 or later" and "MPLv2 or later").*"

Hence, can you formally confirm this statement?

In reply to this question on 20/10/2014, you have stated:

Yes, we confirm this statement.

Can you deliver the DPF Manager for TIFF conformance checker and all other project deliverables in accordance with the IPR model described in the preceding paragraphs?

In reply to this question on 20/10/2014, you have stated:

Yes

A.1.3 Meeting the Challenge for the Proposed Image File Format

The DPF Manager for TIFF project lists a proposed price for Phase I of 57.993 euro. The PreForma Consortium has defined in the Invitation to tender a reference price of 65.000 euro for each open-source project. This reference price should ensure that the Contractor allocates sufficient R&D resources to meet the challenge for establishing one reference implementation.

In the par I. Impact on the Challenge and in the Technical Approach of the DPF Manager for TIFF proposal, you have stated that the design of the implementation checker framework would include an additional “low-level API". In addition, you have stated that:

“As required, the proposed platform enables the integration of the conformance checkers of the other providers through the Shell. However, in order to benefit from the full platform functionalities (see below), third-party modules can be integrated developing what we call an adapter. An adapter is a piece of code that creates a low level integration between the platform and other developments."

The Evaluation Committee has assessed the technical approach for your proposal and compared them with the other proposals.

Hence the Evaluation Committee would like to ask EasyInnova to reallocate the resources for the low-level API and the development of ’adapters’ to the development of the other components that are fully compliant with the functional architecture described in the Challenge Brief. The Evaluation Committee believes this re-allocated is necessary, in order to ensure the project has sufficient resources to meet all objectives of the Challenge Brief in Phase I of the project.

Can you formally accept this request?

In reply to this question on 20/10/2014, you have stated:

Yes, we accept this request. Our proposal of low-level API enables a deeply integration with other open-source projects and third-party developers. Accordingly, we assume that the Evaluation Committee is not interested in this functionality and, therefore, we will dedicate more resources to the components described in the Challenge Brief.

A.1.4 Adherence to License Requirements for All Digital Assets Developed During the PREFORMA Project

Unfortunately, after publication of the PREFORMA tender, we discovered an inconsistency between the PREFORMA Invitation to Tender and the PREFORMA Challenge Brief. Where the Minimal Requirements of the Invitation to Tender require tenderers to make all digital assets developed during the project available under the CC-BY v4.0 license, the Challenge Brief suggests using the CC-BY-SA license.

In the Request for Clarification on the license requirements for digital assets, we have confirm that the use of the CC-BY v4.0 license is mandatory, since this license in particular ensures the development and availability of synthetic files for testing the different conformance checkers developed by the PREFORMA project.

In the reply to this Request for Clarification, you have stated that *“all digital assets developed during the PREFORMA project (incl. project deliverables and test files) will be provided under the open access license Creative Commons CC-BY v4.0."*

Could you hereby formally confirm this statement?

In reply to this question on 20/10/2014, you have stated:

Yes, we confirm this statement.

A.1.5 Project Monitoring and Assessment

As defined in the Framework Agreement (see Articles 14 and 15), the progress of the Project will be reviewed periodically by the PREFORMA Consortium against the specifications detailed in the Invitation to Tender and the Challenge Brief.

In order for PREFORMA Consortium to be able to assess the results of the project, you are therefore requested to include among your deliverables the following reports:

- Two interim reports:
  - A “Program specification report" (due by the end of December 2014), which describes the intended behaviour of the software documented by use cases, application scenarios, etc. (functional specification)
  - A “Software architecture report" (due by the end of February 2014), which describes the structure of the different components and how they are connected to each other (technical specification).
- An End of Design Phase 1 Report, within 14 days of the Completion Date. The End of Design Phase 1 Report shall include the data, methods, results and final conclusions together with management information and any other information relating to the Project up to the Completion Date, and complements the two interim reports listed above.

Templates for the reports mentioned above will soon be made available to the suppliers by the PREFORMA Consortium.

Furthermore, a physical workshop has been planned at the end of Design Phase 1 (beginning of March 2015), probably in Brussels, to allow you (and all the other suppliers) to present to the PREFORMA Consortium the results of the design phase 1. This physical workshop will be part of the assessment of the successful completion of the first design phase. Attendance to this meeting is mandatory and the travel costs should be covered by the suppliers themselves.

In reply to this question on 20/10/2014, you have stated:

We accept the requirements of delivering all the reports mentioned and the attendance to the final meeting.

A.2 Libis

the evaluation committee has identified between the LIBIS/Aware conformance Checker for TIFF proposal and the requirements of the Invitation to Tender and the Challenge Brief and agree on how these issues must be addressed in Phase I of the PREFORMA project.

This formal clarification seeks:

- to ensure that the Contractor has fully understood the issues raised by the Evaluation Committee
- to obtain the commitment of the Contractor to research the issues as agreed in the negotiation,
- to obtain the commitment of the Contractor to resolve the issues as agreed in the negotiation,

- to dedicate the responsibility to perform the R&D in line with the requirements of the ITT and the Challenge Brief to the Contractor

Some of the issues listed below have already been discussed through the requests for clarification and the hearing. In these cases, we have included a report of the discussion so far.

Next three issues raised by the Evaluation Committee should be clarified and agreed upon by the Contractor.

A.2.1 Demonstrate You Are in Possession of All Necessary Rights

The TIFF/EP file format has been put forward by the Evaluation Committee as one of targets for the PREFORMA Project, based on the concern that memory institutions in practice have to deal with a wide variety of TIFF implementations. The TIFF/EP standard contains the core TIFF 6.0 specifications that aim for maximum interoperability of TIFF files as well as a broad set of specifications for managing colour information and technical metadata.

One of the main objectives of the PREFORMA project is to establish a reference implementation for TIFF for which software can be implemented under royalty free conditions.

The Evaluation Committee is aware that Adobe Systems refers to the TIFF 6.0 Specification as a 'public domain raster file format, while the published specification remains under control of Adobe Systems.

The Evaluation Committee is aware that the ISO 12234-2 TIFF/EP specification and the ISO patent database contain references to 17 organisations which declare they control patents that have an impact on parts of the TIFF/EP specification.

Hence, it is not an open standard according to EIFv1, because the intellectual property of the standard is not made irrevocably free on a royalty-free basis.

The Evaluation Committee considers clarifying to which extent the claims of these 17 organisations represent a concrete risk for implementation of the TIFF/EP under royalty free conditions as a vital part of the LIBIS/Aware conformance checker for TIFF project.

In the LIBIS/Aware conformance checker for TIFF proposal, you have stated that *"licensing issues in the TIFF standards can also be a problem. If they occur they won't be included in the list of issues to resolve if no workaround for the licensing is found. The problem will be documented on the website with the description of the errors and best practices that are checked in the conformance checker."* (cf. par. IX Risk Management p. 16)

As already mentioned above, the Evaluation Committee considers clarifying to which extent the current patent claims represent a concrete risk for implementation of the TIFF/EP specification under royalty free conditions as a vital part of the LIBIS/Aware conformance checker for TIFF project.

Hence, the Evaluation Committee expects that LIBIS can formally demonstrate that it has obtained all necessary rights from all organisations that control one (or several) patent(s) (and other IP) which impact on the technical specifications of TIFF/EP), either by:

1. sending us a copy of all license agreements you have signed,

2. sending us a copy of all license agreements you have been offered,

3. sending us a copy of all explicit declarations that the intellectual property of (parts of) the standard is made irrevocably available on a royalty-free basis, or
4. by formally describing the workaround for implementing licensed parts of the standard.

Patent claims from the following list of organisations, listed in the ISO 12234-2 specification and ISO patent database should be considered:

1. Adobe Systems
2. FUJIFILM Corporation
3. Tokyo Electron Device Ltd. - TED
4. Sharp Corporation - IP Group
5. Sanyo Electric Co., Ltd.
6. Matsushita Electric Industrial Co., Ltd.
7. Konica Minolta Holdings, Inc. - IP Center
8. Canon Inc. Headquarters
9. Minolta Co., Ltd.
10. Olympus Optical Co. Ltd.
11. Hitachi, Ltd
12. Photography
13. Toshiba Corporation
14. Kyocera Corporation - Patent Department
15. Ricoh Company, Ltd. - Tokyo
16. NEC Corporation
17. FUJIFILM Corporation

In reply to this question on 20/10/2014, you have stated:
The PREFORMA project will use the ISO standard for TIFF/EP files as a basis for an implementation of the conformance checker. Apparently the TIFF/EP ISO standard is based on an existing patent pool comprising patents of 17 companies.
As the technological field of this present application is difficult to patent due to patentability issues in Europe, cf. Art. 52 European Patent Convention, regarding patentability of software (and to a lesser extent US) the present list of patents probably will not present a danger in Europe.

As a result royalty free valorization of the implementation would be possible in Europe. Based on the effect of the implementation for users in Europe, one could be able to convince these patent holding companies to help improve the TIFF/EP standards and their own formats. This would enable PREFORMA to work together with these companies and to obtain the necessary right for outside Europe (i.e. US). Working together for valorization outside of Europe could be done through a royalty(free) based format.

However, if a company would not be interested in working together with PREFORMA for valorization outside of Europe, there are some issues which they should consider as PREFORMA could refer to the fair, reasonable, and non-discriminatory terms (FRAND) obligation. This FRAND obligation is mostly required by standards organizations for members that participate in the standard-setting process (like ISO).

Standard-setting organizations include this obligation in their bylaws as a means of enhancing the procompetitive character of their industry. They are intended to prevent members from engaging in licensing abuse based on the monopolistic advantage generated as a result of having their IPR rights included in the industry standards.

Based on the above, we believe that for the PREFORMA project:

(1) It is not sure that we are effectively trespassing third party rights, as we do not know which claims are referred to and if these granted patents are still maintained. However researchers of the PREFORMA consortium together with their technology transfer offices will investigate all possible third party claims in order to obtain the patent landscape which should be considered.

(2) Moreover, if there would be any third party rights to consider, we would be able to obtain the necessary rights (again if needed) during the timeframe of the project, without impairing valorization in Europe of the results obtained from European funding money. Or we will document the problem and find a workaround for the problem, for example by excluding the problematic part or by providing an alternative not covered by a third party claim (i.e. a workaround).

(3) As the PREFORMA researchers are aware of the risks w.r.t. third party rights and are willing to obtain a patent landscape, future research routes will always be addressed in function of eventual existing third party rights, such that freedom of valorization of the research results in Europe and worldwide is as high as possible.

During the course of Phase 1 of the project we will monitor the intellectual property issues and we will add an intellectual property chapter to the interim report of December and to the final report of Phase 1. The chapter will contain a list of identified issue and the actions taken or to be taken.

A.2.2 Adherence to License Requirements for the Software Developed and Used in the PREFORMA Project

The Evaluation Committee expressed the concern that the license policy as described in the LIBIS/Aware proposal (cf. MPL2) is not fully compliant with the license model required by the Invitation to Tender.

PREFORMA has minimum requirements concerning use of two specific Open Source licenses, i.e. "GPLv3 or later" and "MPLv2 or later" for all software developed and used.

The choice of "GPLv3 or later" will minimise risks for memory institutions. If a file format is provided under conditions which imply that it can be implemented in a software system and provided

(on an open platform) under the "GPLv3 or later" license, the PREFORMA consortium minimise the (legal) risk for not being able to use, evolve and redistribute the software over very long life-cycles.

The choice of "MPLv2 or later" allows memory institutions full flexibility in terms of integration of developed software with their legacy systems, something which may become an issue if the PREFORMA project would only have selected the "GPLv3 or later" alternative.

This is in contrast with several permissive Open Source licenses (e.g. BSD which lacks patent clauses) and such would expose memory institutions to significant legal risks related to patent infringements and thereby no protection against legal threats.

This choice is based on extensive prior research and for PREFORMA this is important for a number of reasons (including: a future proof software; licensing issues to allow integration and distribution; sustainability of communities; legal protection for memory institutions; etc.). In order to clarify the licensing conditions for software, as expressed in Section 5.1 of the Invitation to Tender, you need to confirm that you intend to meet the minimum requirements for licensing of all software developed and used in PREFORMA.

The term "developed" refers to both:

(1) development for new code for the LIBIS/Aware conformance Checker for TIFF conformance checker,

(2) contributions to third party software under the same licenses that is used in the LIBIS/Aware conformance Checker for TIFF conformance checker to perform its function. E.g. when utilising open source work practices developers typically contribute bug fixes (perhaps a few lines of code) to an existing project

The term “used" refers to both:

(3) passive use of a third party Open Source project in the LIBIS/Aware conformance Checker for TIFF conformance checker,

(4) software used to develop, maintain, test and operate the LIBIS/Aware conformance Checker for TIFF project as a whole i.c. software for developing and maintaining the source code of the LIBIS/Aware conformance checker, testing the LIBIS/Aware conformance checker and managing the open source community..

The Evaluation Committee expects that:

(1) new code developed for the LIBIS/Aware conformance Checker for TIFF conformance checker

(2) contributions to third party software used in the LIBIS/Aware conformance Checker for TIFF conformance checker to perform its function, and

(3) third party software used in the LIBIS/Aware conformance Checker for TIFF conformance checker to perform its function must all be licensed under both "GPLv3 or later" and "MPLv2 or later".

Hence (4) software used to develop, maintain, test and operate the LIBIS/Aware conformance Checker for TIFF project as a whole should be licensed under a generally recognized open source software license, compatible with the license granted under the Agreement (cf. par. 17.5 of the Framework Agreement)..

The Evaluation Committee expects that the environment for building the code is open source. Hence, source code can hosted using common and freely available third-party platforms (e.g. GitHub, GoogleCode), although these platforms are not necessarily open source.

Furthermore, the Evaluation Committee does not expect software for creating test files to be available under specific Open source licenses and acknowledges that the corpus of test files to be used for testing the LIBIS/Aware conformance checker preferably originates from a wide range of producing software.

In the reply to the Request for Clarification, you stated that *"All software developed and used during the development of the PREFORMA project will be licensed under "GPLv3 or later" and "MPLv2 or later"*.

Hence, can you formally confirm this statement?

Can you deliver the LIBIS/Aware conformance checker and all other project deliverables in accordance with the IPR model described in the preceding paragraphs?

In reply to this question on 20/10/2014, you have stated:

We formally confirm our previous statement in the Request for clarification: *"All software developed and used during the development of the PREFORMA project will be licensed under "GPLv3 or later" and "MPLv2 or later"*. We will deliver the LIBIS/Aware conformance checker and all other project deliverables in accordance with the IPR model as described in the Challenge brief and specified in the negotiation report.

A.2.3 Adherence to License Requirements for All Digital Assets Developed During the PREFORMA Project

Unfortunately, after publication of the PREFORMA tender, we discovered an inconsistency between the PREFORMA Invitation to Tender and the PREFORMA Challenge Brief. Where the Minimal Requirements of the Invitation to Tender require tenderers to make all digital assets developed during the project available under the CC-BY v4.0 license, the Challenge Brief suggests using the CC-BY-SA license.

In the Request for Clarification on the license requirements for digital assets, we have confirm that the use of the CC-BY v4.0 license is mandatory, since this license in particular ensures the development and availability of synthetic files for testing the different conformance checkers developed by the PREFORMA project.

In the reply to this Request for Clarification, you have stated that *"All the files (incl. project deliverables and test files) will be Creative Commons CC-BY v4.0. In the test files the files provided by the PREFORMA testing partner are not included. These are only the files created by LIBIS and Aware. We don't have ownership of the test files from the PREFORMA test partner, so we can't decide over the licence, but we assume during the PREFORMA project the test partners contributed their test files according to the specifications of the project."*

Could you hereby formally confirm this statement?

In reply to this question on 20/10/2014, you have stated:

We formally confirm our previous statement in the Request for clarification: *"All the files (incl. project deliverables and test files) will be Creative Commons CC-BY v4.0. In the test files the files provided by the PREFORMA testing partner are not included. These are only the files created by LIBIS and Aware. We don't have ownership of the test files from the PREFORMA test partner, so we can't decide over the licence, but we assume during the PREFORMA project the test partners contributed their test files according to the specifications of the project."*

A.2.4 Project Monitoring and Assessment

As defined in the Framework Agreement (see Articles 14 and 15), the progress of the Project will be reviewed periodically by the PREFORMA Consortium against the specifications detailed in the Invitation to Tender and the Challenge Brief.

In order for PREFORMA Consortium to be able to assess the results of the project, you are therefore requested to include among your deliverables the following reports:

- Two interim reports:
  - A “Program specification report" (due by the end of December 2014), which describes the intended behaviour of the software documented by use cases, application scenarios, etc. (functional specification)
  - A “Software architecture report" (due by the end of February 2014), which describes the structure of the different components and how they are connected to each other (technical specification).
- An End of Design Phase 1 Report, within 14 days of the Completion Date. The End of Design Phase 1 Report shall include the data, methods, results and final conclusions together with management information and any other information relating to the Project up to the Completion Date, and complements the two interim reports listed above.

Templates for the reports mentioned above will soon be made available to the suppliers by the PREFORMA Consortium.

Furthermore, a physical workshop has been planned at the end of Design Phase 1 (beginning of March 2015), probably in Brussels, to allow you (and all the other suppliers) to present to the PREFORMA Consortium the results of the design phase 1. This physical workshop will be part of the assessment of the successful completion of the first design phase. Attendance to this meeting is mandatory and the travel costs should be covered by the suppliers themselves.

In reply to the question in the negotiation report on 21/10/2014, you have stated:

The project monitoring and assessment as is specified in the addendum and Framework agreement will be followed.

A.3 MediaArea

The objective of this negotiation protocol is to formally clarify the possible incongruities which the evaluation committee has identified between the PreForma MediaInfo proposal and the requirements of the Invitation to Tender and the Challenge Brief and agree on how these issues must be addressed in Phase I of the PREFORMA project.

This formal clarification seeks:

- to ensure that the Contractor has fully understood the issues raised by the Evaluation Committee
- to obtain the commitment of the Contractor to research the issues as agreed in the negotiation,

- to obtain the commitment of the Contractor to resolve the issues as agreed in the negotiation,
- to dedicate the responsibility to perform the R&D in line with the requirements of the ITT and the Challenge Brief to the Contractor

Some of the issues listed below have already been discussed through the requests for clarification and the hearing. For the sake of completeness, we have included a report of the discussion so far.

Next three issues raised by the Evaluation Committee should be clarified and agreed upon by the Contractor.

A.3.1 Adherence to License Requirements for the Software Developed and Used in the PREFORMA Project

The Evaluation Committee expressed the concern that the current license policy of MediaInfo may complicate the IPR model set forth in the Invitation to Tender.

PREFORMA has minimum requirements concerning use of two specific Open Source licenses, i.e. "GPLv3 or later" and "MPLv2 or later" for all software developed and used.

The choice of "GPLv3 or later" will minimise risks for memory institutions. If a file format is provided under conditions which imply that it can be implemented in a software system and provided (on an open platform) under the "GPLv3 or later" license, the PREFORMA consortium minimise the (legal) risk for not being able to use, evolve and redistribute the software over very long life-cycles.

The choice of "MPLv2 or later" allows memory institutions full flexibility in terms of integration of developed software with their legacy systems, something which may become an issue if the PREFORMA project would only have selected the "GPLv3 or later" alternative.

This is in contrast with several permissive Open Source licenses (e.g. BSD which lacks patent clauses) and such would expose memory institutions to significant legal risks related to patent infringements and thereby no protection against legal threats.

This choice is based on extensive prior research and for PREFORMA this is important for a number of reasons (including: a future proof software; licensing issues to allow integration and distribution; sustainability of communities; legal protection for memory institutions; etc.). In order to clarify the licensing conditions for software, as expressed in Section 5.1 of the Invitation to Tender, you need to confirm that you intend to meet the minimum requirements for licensing of all software developed and used in the PREFORMA project.

The term "developed" refers to both:

(1) development for new code for the PreForma MediaInfo conformance checker,

(2) contributions to third party software under the same licenses that is used in the PreForma MediaInfo conformance checker to perform its function. E.g. when utilizing open source work practices developers typically contribute bug fixes (perhaps a few lines of code) to an existing project.

The term “used" refers to both:

(3) use of a third party Open Source project in the PreForma MediaInfo conformance checker to perform its function,

(4) software used to develop, maintain, test and operate the PreForma MediaInfo project as a whole i.c. software for developing and maintaining the source code of the PreForma MediaInfo

conformance checker, testing the PreForma MediaInfo conformance checker and managing the open source community.

The Evaluation Committee expects that:

(1) new code developed for the PreForma MediaInfo conformance checker

(2) contributions to third party software used in the PreForma MediaInfo conformance checker to perform its function, and

(3) third party software used in the PreForma MediaInfo conformance checker to perform its function must all be licensed under both "GPLv3 or later" and "MPLv2 or later".

Hence (4) software used to develop, maintain, test and operate the PreForma MediaInfo project as a whole should be licensed under a generally recognized open source software license, compatible with the license granted under the Agreement (cf. par. 17.5 of the Framework Agreement).

The Evaluation Committee expects that the environment for building the code is open source. Hence, source code can hosted using common and freely available third-party platforms (e.g. GitHub, GoogleCode), although these platforms are not necessarily open source.

Furthermore, the Evaluation Committee does not expect software for creating test files to be available under specific Open source licenses and acknowledges that the corpus of test files to be used for testing the PreForma MediaInfo conformance checker preferably originates from a wide range of producing software.

Can you formally confirm that you will comply with the IPR model for respectively the PreForma MediaInfo conformance checker and PreForma MediaInfo project as described in the preceding paragraphs?

In the reply to the Request for Clarification on 28/8/2014, you stated that *“all deliverables will be released under “GPLv3 or later" and “MPLv2 or later" licenses."*

In reply to the question in the negotiation report on 13/10/2014, you have stated:

We appreciate the clarifications you’ve provided in this section, particularly the definition of "used" software. As mentioned before and as requested to be confirmed by the Negotiation Report, MediaArea.net agrees that new code developed for the PreForma MediaInfo conformance checker, contributions to third party software used in the PreForma MediaInfo conformance checker, and third party software used in the PreForma MediaInfo conformance checker will be licensed under both "GPLv3 or later" and "MPLv2 or later". For MediaArea.net as an organization and well as on a personal level for the principles involved, we strongly support the open source objectives and requirements of this project, have experience in using these licenses, and heartily agree to this requirement.

We also agree that: "software used to develop, maintain, test and operate the PreForma MediaInfo project as a whole e.g. for creating test files to test the PreForma MediaInfo conformance checker must be is freely available in open source form."

MediaArea.net also confirms that “all deliverables will be released under “GPLv3 or later" and “MPLv2 or later" licenses" and that MediaArea.net will "deliver the MediaInfo conformance checker and all other project deliverables in accordance with the IPR model described in the provided Negotiation Report dated October 10, 2014".

A.3.2 Meeting the Challenge for the Proposed Audio-Visual and Text File Format

The PreForma MediaInfo project lists a proposed price for Phase I of 64.028 euro. The Evaluation Committee considers a reference budget of 65.000 euro as convenient for establishing an open-source project. This reference budget should ensure that the Contractor allocates sufficient R&D resources to meet the challenge for establishing one reference implementation.

The PreForma MediaInfo proposal covers two open source projects: a text project on PDF/A and an audio-visual project on MKV, FFV1, JPEG2000 and LPCM.

The Evaluation Committee has assessed the technical approach for both projects and compared them with the other proposals.

Hence, the Evaluation Committee would like request MediaArea.net to reconsider the allocation of resources on the two proposed projects, in order to ensure that the PreForma MediaInfo project has sufficient resources to meet the objectives of the Challenge Brief.

Hence, the Evaluation Committee would like to request MediaArea.net to reallocate resources on the audio-visual project, addressing MKV, FFV1 and LPCM, and omitting JPEG2000.

Furthermore, the Evaluation Committee has a strong preference for an audio-visual project on MKV, FFV1 and LPCM, since such a project is most convenient for the PREFORMA project as a whole. Therefore the Evaluation Committee invites MediaArea.net to consider the possibility to work only on the audio-visual project.

However, the Evaluation Committee is still welcoming a combined text and audio-visual project, but wishes to emphasize that in this case MediaArea.net is expected to deliver a comprehensive design for both the text and the audio-visual project at the end of Phase 1.

In reply to the question in the negotiation report on 13/10/2014, you have stated:

We understand that the PREFORMA project organizers would like MediaArea.net to consider constraining focus to MKV, FFV1 and LPCM. We are still discussing the best response to the suggestions of this section and wish to respond in a manner that is cooperative and efficient to the planning of the PreForma project as a whole. We can certainly agree to deliver a comprehensive design with a strong focus on FFV1, MKV, and LPCM but do wish to allow PDF/A and JPEG2000 a role in our work due to the research and planning already allocated to these formats in early project planning.

In reply to the question in the negotiation report on 17/10/2014, you have stated:

Concerning the different domains, we are flexible and we accept the recommendation from the Evaluation Committee to allocate MediaArea's resources for only some formats, but we would like to get a chance to demonstrate our ability to work on different formats. From our understanding of the wishes of the Evaluation Committee, we would like to propose to allocate our resources and to prepare the deliverables for the end of the Design phase this way:

- Main part: Conformance Checker for MKV, FFV1 and LPCM; 85% of allocated resources.
- Annex A: Addition for PDF/A support, as a proof of concept; 10% of allocated resources
- Annex B: Addition for JPEG2000 support, as a proof of concept; 5% of allocated resources

The Evaluation Committee acknowledges and appreciates that MediaArea.net would like to demonstrate their ability to work on different formats. Though, the Evaluation Committee prefers

MediaArea.net to allocate all resources in the Design Phase to the 'Main part', i.c. the Conformance Checker for MKV, FFV1 and LPCM.

The Evaluation Committee prefers to advance the integration of implementation checker components (e.g. JPEG2000 and PDF/A) from other tenderers in the PreForma MediaInfo solution. The Evaluation Committee considers a scenario where an implementation checker component is integrated by multiple tenderers as most beneficial for realizing a healthy ecosystem around the PREFORMA tools. Therefore, the Evaluation Committee would welcome contributions from MediaArea.net to other open source projects in the next phases of the PREFORMA project.

A.4 Adherence to License Requirements for All Digital Assets Developed During the Preforma Project

Unfortunately, after publication of the PREFORMA tender, we discovered an inconsistency between the PREFORMA Invitation to Tender and the PREFORMA Challenge Brief. Where the Minimal Requirements of the Invitation to Tender require tenderers to make all digital assets developed during the project available under the CC-BY v4.0 license, the Challenge Brief suggests using the CC-BY-SA license.

In the Request for Clarification on the license requirements for digital assets, we have confirm that the use of the CC-BY v4.0 license is mandatory, since this license in particular ensures the development and availability of synthetic files for testing the different conformance checkers developed by the PREFORMA project.

In the reply to this Request for Clarification on 15/9/2014, you have stated that you will *"comply fully with all licensing requirements of the PREFORMA consortium and that you will use the CC-BY 4.0 licence instead of the CC-BY-SA licence for all digital assets developed during the project (including deliverables and test corpora)"*.

In reply to the question in the negotiation report on 13/10/2014, you have confirmed:

We clarify our support for the use of open licenses throughout the project and verify our statement to "comply fully with all licensing requirements of the PREFORMA consortium" and that MediaArea.net will "use the CC-BY 4.0 licence instead of the CC-BY-SA licence for all digital assets developed during the project (including deliverables and test corpora)".

A.4.1 Project Monitoring and Assessment

As defined in the Framework Agreement (see Articles 14 and 15), the progress of the Project will be reviewed periodically by the PREFORMA Consortium against the specifications detailed in the Invitation to Tender and the Challenge Brief. In order for PREFORMA Consortium to be able to assess the results of the project, you are therefore requested to include among your deliverables the following reports:

- Two interim reports:
  - A "Program specification report" (due by the end of December 2014), which describes the intended behaviour of the software documented by use cases, application scenarios, etc. (functional specification)

  - A “Software architecture report" (due by the end of February 2014), which describes the structure of the different components and how they are connected to each other (technical specification).

- An End of Design Phase 1 Report, within 14 days of the Completion Date. The End of Design Phase 1 Report shall include the data, methods, results and final conclusions together with management information and any other information relating to the Project up to the Completion Date, and complements the two interim reports listed above.

Templates for the reports mentioned above will soon be made available to the suppliers by the PREFORMA Consortium.

Furthermore, a physical workshop has been planned at the end of Design Phase 1 (beginning of March 2015), probably in Brussels, to allow you (and all the other suppliers) to present to the PREFORMA Consortium the results of the design phase 1. This physical workshop will be part of the assessment of the successful completion of the first design phase. Attendance to this meeting is mandatory and the travel costs should be covered by the suppliers themselves.

In reply to the question in the negotiation report on 21/10/2014, you have stated:

We agree to additional request for clarification on the Project management and Reporting.

A.5 Preservica

The objective of this negotiation protocol is to formally clarify the possible incongruities which the evaluation committee has identified between the Digital Preservation Validation Framework proposal and the requirements of the Invitation to Tender and the Challenge Brief and agree on how these issues must be addressed in Phase I of the PREFORMA project.

This formal clarification seeks:

- to ensure that the Contractor has fully understood the issues raised by the Evaluation Committee

- to obtain the commitment of the Contractor to research the issues raised,

- to obtain the commitment of the Contractor to resolve the issues raised,

- to dedicate the responsibility of the Contractor to perform the R&D in line with the requirements of the ITT and the Challenge Brief.

Some of the issues listed below have already been discussed through the requests for clarification and the hearing. For the sake of completeness, we have included a report of the discussion so far.

Next four issues raised by the Evaluation Committee should be clarified and agreed upon by the Contractor.

A.5.1 Adherence to License Requirements for the Software Developed and Used in the PREFORMA Project

The Evaluation Committee expressed the concern that the license policy as described in the Digital Preservation Validation Framework proposal is not fully compliant with the license model required by the Invitation to Tender.

PREFORMA has minimum requirements concerning use of two specific Open Source licenses, i.e. "GPLv3 or later" and "MPLv2 or later", for all software developed and used.

The choice of "GPLv3 or later" will minimise risks for memory institutions. If a file format is provided under conditions which imply that it can be implemented in a software system and provided (on an open platform) under the "GPLv3 or later" license, the PREFORMA consortium minimise the (legal) risk for not being able to use, evolve and redistribute the software over very long life-cycles.

The choice of "MPLv2 or later" allows memory institutions full flexibility in terms of integration of developed software with their legacy systems, something which may become an issue if the PREFORMA project would only have selected the "GPLv3 or later" alternative.

This is in contrast with several permissive Open Source licenses (e.g. BSD which lacks patent clauses) and such would expose memory institutions to significant legal risks related to patent infringements and thereby no protection against legal threats.

This choice is based on extensive prior research and for PREFORMA this is important for a number of reasons (including: a future proof software; licensing issues to allow integration and distribution; sustainability of communities; legal protection for memory institutions; etc.). In order to clarify the licensing conditions for software, as expressed in Section 5.1 of the Invitation to Tender, you need to confirm that you intend to meet the minimum requirements for licensing of all software developed and used in PREFORMA.

The term "developed" refers to both:

(1) development for new code for the Digital Preservation Validation Framework conformance checker,

(2) contributions to third party software under the same licenses that is used in the Digital Preservation Validation Framework conformance checker to perform its function. E.g. when utilising open source work practices developers typically contribute bug fixes (perhaps a few lines of code) to an existing project.

The term “used" refers to both:

(3) use of a third party Open Source project in the Digital Preservation Validation Framework conformance checker to perform its function,

(4) software used to develop, maintain, test and operate the Digital Preservation Validation Framework project as a whole i.c. software for developing and maintaining the source code of the Digital Preservation Validation Framework conformance checker, testing the Digital Preservation Validation Framework conformance checker and managing the open source community.

The Evaluation Committee expects that:

(1) new code developed for the Digital Preservation Validation Framework conformance checker

(2) contributions to third party software used in the Digital Preservation Validation Framework conformance checker to perform its function, and

(3) third party software used in the Digital Preservation Validation Framework conformance checker must all be licensed under both "GPLv3 or later" and "MPLv2 or later".

Hence (4) software used to develop, maintain, test and operate the Digital Preservation Validation Framework project as a whole should be licensed under a generally recognized open source software license, compatible with the license granted under the Agreement (cf. par. 17.5 of the Framework Agreement)..

The Evaluation Committee expects that the environment for building the code is open source. Hence, source code can hosted using common and freely available third-party platforms (e.g. GitHub, GoogleCode), although these platforms are not necessarily open source.

Furthermore, the Evaluation Committee does not expect software for creating test files to be available under specific Open source licenses and acknowledges that the corpus of test files to be used for testing the Digital Preservation Validation Framework conformance checker preferably originates from a wide range of producing software.

In the reply to the Request for Clarification, you confirmed that *“the source code extracted from the native Preservica product code base will be released under “GPLv3 or later" and “MPLv2 or later" licenses" and that “all software that Preservica would potentially developed under this project would be licensed under two specific Open Source licenses ("GPLv3 or later" and "MPLv2 or later")"*.

In reply to this question on 14/10/2014, you have stated:

Yes we confirm this statement.

A.5.2 Adherence to License Requirements for All Digital Assets Developed During the PREFORMA Project

Unfortunately, after publication of the PREFORMA tender, we discovered an inconsistency between the PREFORMA Invitation to Tender and the PREFORMA Challenge Brief. Where the Minimal Requirements of the Invitation to Tender require tenderers to make all digital assets developed during the project available under the CC-BY v4.0 license, the Challenge Brief suggests using the CC-BY-SA license.

In the Request for Clarification on the license requirements for digital assets, we have confirm that the use of the CC-BY v4.0 license is mandatory, since this license in particular ensures the development and availability of synthetic files for testing the different conformance checkers developed by the PREFORMA project. In the reply to this Request for Clarification, you confirmed that “all digital assets developed during the PREFORMA project (incl. project deliverables and test files) will be provided under the open access license Creative Commons CC-BY v4.0".

In reply to this question on 14/10/2014, you have stated:

Yes we confirm this statement.

A.5.3 Meeting the Challenge for the Proposed Text File Format

The Digital Preservation Validation Framework project lists a proposed price for Phase I of 71.235,28 euro. The PreForma Consortium has defined in the Invitation to tender a total budget of 390.000 euro, available for all open-source projects in Phase I. This budget should ensure that all Contractor

allocate sufficient R&D resources to meet the challenge for establishing one reference implementation.

The Digital Preservation Validation Framework proposal covers three open source projects: a text project on PDF/A, an image project on TIFF and an audio-visual project on MKV, OGG and JPEG2000.

In the Technical Approach of the Digital Preservation Validation Framework proposal, you have stated that the design of the implementation checker framework would include *"detailing how to validate one format (we suggest the various varieties of PDF/A) in detail by listing the features that need to be validated, which of these can be done by reusing existing code from one (or more) compatible open-source tools and then designing how to validate the rest within a single, coherent validator."*

In addition, you have stated that *"the final development phase would then make the changes needed as a result of any redesign and add in the remaining formats (in particular TIFF, JPEG2000, MKV and OGG) to the validation and policy checking frameworks using a similar approach to that described for PDF/A above."*

The Evaluation Committee has assessed the technical approach for your proposal and compared them with the other proposals.

Hence the Evaluation Committee would like to ask Preservica to have resources allocated on the text project only, in order to ensure the project has sufficient resources to meet all objectives of the Challenge Brief in Phase I as well as the succeeding phases, in particular the challenge of establishing a reference implementation for PDF/A.

In reply to this question on 14/10/2014, you have stated:

Yes, we are happy to do the file format you requested. We want to make sure it is to the most benefit to the project at large, however it would be useful to find out more about how we can work in partnership with other partners to maximise the outcome to the project, etc.

A.5.4 Project Monitoring and Assessment

As defined in the Framework Agreement (see Articles 14 and 15), the progress of the Project will be reviewed periodically by the PREFORMA Consortium against the specifications detailed in the Invitation to Tender and the Challenge Brief.

In order for PREFORMA Consortium to be able to assess the results of the project, you are therefore requested to include among your deliverables the following reports:

- Two interim reports:
  - A "Program specification report" (due by the end of December 2014), which describes the intended behaviour of the software documented by use cases, application scenarios, etc. (functional specification)
  - A "Software architecture report" (due by the end of February 2014), which describes the structure of the different components and how they are connected to each other (technical specification).

- An End of Design Phase 1 Report, within 14 days of the Completion Date. The End of Design Phase 1 Report shall include the data, methods, results and final conclusions together with management information and any other information relating to the Project up to the Completion Date, and complements the two interim reports listed above.

Templates for the reports mentioned above will soon be made available to the suppliers by the PREFORMA Consortium.

Furthermore, a physical workshop has been planned at the end of Design Phase 1 (beginning of March 2015), probably in Brussels, to allow you (and all the other suppliers) to present to the PREFORMA Consortium the results of the design phase 1. This physical workshop will be part of the assessment of the successful completion of the first design phase. Attendance to this meeting is mandatory and the travel costs should be covered by the suppliers themselves.

In reply to this question on 20/10/2014, you have stated:

Yes, we can confirm we are happy with this paragraph regarding the deliverables and meetings for phase 1.

A.6 Universitè Catholique de Louvain

The objective of this negotiation protocol is to formally clarify the possible incongruities which the evaluation committee has identified between the OpenMediaCheck proposal and the requirements of the Invitation to Tender and the Challenge Brief and agree on how these issues must be addressed in Phase I of the PREFORMA project.

This formal clarification seeks:

- to ensure that the Contractor has fully understood the issues raised by the Evaluation Committee
- to obtain the commitment of the Contractor to research the issues as agreed in the negotiation,
- to obtain the commitment of the Contractor to resolve the issues as agreed in the negotiation,
- to dedicate the responsibility to perform the R&D in line with the requirements of the ITT and the Challenge Brief to the Contractor

Some of the issues listed below have already been discussed through the requests for clarification and the hearing. For the sake of completeness, we have included a report of the discussion so far.

Next six issues raised by the Evaluation Committee should be clarified and agreed upon by the Contractor.

A.6.1 Demonstrate You Are in Possession of All Necessary Rights

The Evaluation Committee expressed the concern that the patent claims on the JPEG2000 core encoding may complicate the IPR model set forth in the Invitation to Tender.

The JPEG2000 file format has been put forward by the PREFORMA Consortium as one of targets for the PREFORMA Project, based on the concern that memory institutions are facing in

the near future the ingest of considerable amounts of JPEG2000 streams, representing cinematographic and broadcast materials, while there is no consensus on what is an appropriate audio-visual preservation profile, neither is the software available for checking these files. Hence, the JPEG2000 format has been included in the minimal requirements as part of project for establishing a reference implementation for audio-visual media.

The Evaluation Committee is aware that, since the ISO/IEC 15444-1 specification and the ISO patent database contains references to 20 organisations that declare they control patents that have an impact on the JPEG2000 core coding system, part 1 of JPEG 2000 is not an open standard according to EIFv1, because the intellectual property of the standard is not made irrevocably free on a royalty-free basis.

The Evaluation Committee considers clarifying to which extent the claims of these 20 organisations represent a concrete risk for implementation of the JPEG2000 core encoding under royalty free conditions as a vital part of the OpenMediaCheck project.

In the OpenMediaCheck proposal, you have stated that , to the best of your knowledge, 'there is no existing intellectual property that could limit your freedom to operate and deliver the proposed software' (par V. page 11).

In the reply to the Request for Clarification on the JPEG2000 patent claims, you have answered "yes" to the question whether you can demonstrate that the necessary licenses, permits and consents to use and implement the JPEG 2000 core coding system have been acquired

In the reply to the question of the Hearing, you have acknowledged the list of patent holders in Annex L of the ISO 15444-1 and the ISO patent database. And you have stated that the list has been discussed with the JPEG Committee that maintains the JPEG2000 specification. You conclusion was that you believed there is an informal agreement that anyone can implement the specifications for the core coding system on a royalty free basis.

As already mentioned above, the Evaluation Committee considers clarifying to which extent the current patent claims represent a concrete risk for implementation of the JPEG2000 core encoding under royalty free conditions as a vital part of the OpenMediaCheck project.

Hence, the Evaluation Committee expects that UCL can formally demonstrate that it has obtained all necessary rights from all organisations that control one (or several) patent(s) (and other IP) which impact on the technical specifications of the JPEG 2000 core coding system (ISO/IEC 15444-1), either by:

1. sending us a copy of all license agreements you have signed
2. sending us a copy of all license agreements you have been offered
3. sending us a copy of all explicit declarations that the intellectual property of (parts of) the standard is made irrevocably available on a royalty-free basis.

At least patent claims from the following list of organisations, listed in Annex L of the IEC/ISO 51444-1 specification and patent database should be considered:

	Organisation	Reference to patents	Annex L IEC/ISO 15444-1	ISO Database
1	Algo Vision plc		X	X
2	Canon Inc. Headquarters		X	X
3	Digital Accelerator Corporation		X	
4	Hewlett-Packard Comp	Context-Based Ordering and Coding of Transform Coefficient Bit-Planes for Embedded Bitstreams; Decoding of Embedded Bitstreams Produced by Context-Based Ordering and Coding of Transform Coefficient Bit-Planes	X	X
5	IBM - N.Y.	Information Technology - JPEG 2000 Image Coding System; Patent Nrs. 4905297, 4633490, 4935882, 4467317, 4295125, 4286256, 4463342, 4463342, 5099440, 4652856, 4891643 http://patents.iec.ch/TISS/Patents.nsf/0/69E303E62FE6C46FC12578EE0041E92C/$file/isoiec15444-1.pdf (free)		X
6	International Business Machines, Inc.			X
7	LizardTech, Incorporated		X	
8	LuraTech		X	
9	Mitsubishi Electric Corporation	Mitsubishi's Arithmetic Coder Licenses Related to JPEG2000; patent nrs. 2128115, 2128110	X	X
10	PrimaComp Incorporated		X	
11	Qualcomm Incorporated	http://patents.iec.ch/TISS/Patents.nsf/0/87E1000BACEC7C98C1257690003F029A/$file/isoiec15444-1%202004%20FDAM4.pdf (RAND)	X	
12	Ricoh Company, Limited		X	
13	Sarnoff Corporation		X	
14	Sharp Corporation		X	X
15	Sony Corporation		X	X

	Organisation	Reference to patents	Annex L IEC/ISO 15444-1	ISO Database
16	Telcordia Technologies Inc.	Information Technology - JPEG 2000 Image Coding System; Patent Nr. 4,829,378 http://patents.iec.ch/TISS/Patents.nsf/0/247595F47EFD9140C1257507003EE522/$file/15444-1.pdf (RAND)		X
17	Telefonaktiebolaget LM Ericsson		X	
18	TeraLogic Incorporated		X	
19	University of Arizona		X	
20	Washington State University		X	

In the reply to the Negotiation Report on 21/10/2014, you have stated:

UCL acknowledges the concern of the Evaluation Committee about the JPEG 2000 patent issues. Information has been asked to the JPEG Committee, and in particular to Prof. Touradj Ebrahimi (WG1 Convener) and Dr Thomas Richter. The situation concerning patents might be summarized in the following way:

- The goal of the JPEG Committee has always been to develop standards that could be used as widely as possible, royalty-free. Up to now, this has always been the case (most recent tentatives from patent-troll company Forgent to use its patent on baseline JPEG has been rejected by court).
- In the case of JPEG 2000, patent holders listed in Annex L and on ISO website have all indicated that they are willing to negotiate free or RAND licenses, as written in Annex L and on ISO website.
- Up to now, 10 years after its standardization, JPEG 2000 Part-1 has always been used royalty-free and not a single patent issue has occurred whereas it has been extensively used in high-value markets like Digital Cinema and Broadcasting.
- Moreover, most technologies present in JPEG 2000 are more than 20 years old and many of the concerned patents are actually expired.
- However, image and video compression is a highly patented field and no guarantee can actually be given that a third-party patent will not pop up at some point. This is actually also the case for any image and video codec, including Dirac and FFV1.

Concerning the PREFORMA project, as JPEG 2000 Part-1 is already widely used in the archive field without any issues regarding patent royalties, and as JPEG 2000 would be used in our proposal

through the official open-source reference implementation from ISO, we are confident there will be no patent issue.

However, to reassure the Evaluation Committee, and given that most patents are related to the encoding and decoding process and not to the codestream syntax, we can propose to develop a JPEG 2000 conformance checker using a subset of the OpenJPEG library. This subset would only include the codestream syntax related source files. If JPEG 2000 encoding and decoding filters are to be subsequently added to our shell, they will be provided under the sole responsibility of their owners.

The Evaluation Committee welcomes the proposal to use a subset of the OpenJpeg library that relates to the codestream syntax, if this enables to avoid implementing parts of the ISO 15444-1 specification for which there are patent claims. The Evaluation Committee would like to inform if creating such a subset would also enable relicensing this part of the source code under the licenses required by the PREFORMA Invitation To Tender.

In reply to your clarification:

1. The Evaluation Committee welcomes the proposal to use a subset of the OpenJpeg library that relates to the codestream syntax, if this enables to avoid implementing parts of the ISO 15444-1 specification for which there are patent claims.

2. The Evaluation Committee acknowledges that, to our knowledge, little or no patent issues have occurred as to the ISO15444-1 specification. Nevertheless, for the sake of long-term preservation, the Evaluation Committee considers it necessary to have a clear and updated view on the current claims of companies controlling patents on this specification.

   Therefore the Evaluation Committee expects UCL to provide as part of the design phase, a detailed overview of all patent claims that relate to ISO 15444-1, including information on:

   - the organization that claims to control the patent,
   - the nature of the claim made,
   - the type of license that the organisation is willing to negotiate and the expected cost of the license, and
   - the date on which the patent expires.

The Evaluation committee believes that providing this information is necessary to make an informed evaluation of the appropriateness of JPEG2000 for long term preservation and indispensable for businesses developing sustainable long term preservation services.

The Evaluation Committee will continue discussing the need for obtaining licenses on the patented parts of the ISO 15444-1 specification during the Design Phase.

A.6.2 Adherence to License Requirements for the Software Developed and Used in the PREFORMA Project

The Evaluation Committee expressed the concern that the current license policy of OpenJpeg and OpenInterface projects may complicate the IPR model set forth in the Invitation to Tender.

PREFORMA has minimum requirements concerning use of two specific Open Source licenses, i.e. "GPLv3 or later" and "MPLv2 or later" for all software developed and used.

The choice of "GPLv3 or later" will minimise risks for memory institutions. If a file format is provided under conditions which imply that it can be implemented in a software system and provided (on an open platform) under the "GPLv3 or later" license, the PREFORMA consortium minimise the (legal) risk for not being able to use, evolve and redistribute the software over very long life-cycles.

The choice of "MPLv2 or later" allows memory institutions full flexibility in terms of integration of developed software with their legacy systems, something which may become an issue if the PREFORMA project would only have selected the "GPLv3 or later" alternative.

This is in contrast with several permissive Open Source licenses (e.g. BSD which lacks patent clauses) and such would expose memory institutions to significant legal risks related to patent infringements and thereby no protection against legal threats.

This choice is based on extensive prior research and for PREFORMA this is important for a number of reasons (including: a future proof software; licensing issues to allow integration and distribution; sustainability of communities; legal protection for memory institutions; etc.). In order to clarify the licensing conditions for software, as expressed in Section 5.1 of the Invitation to Tender, you need to confirm that you intend to meet the minimum requirements for licensing of all software developed and used in PREFORMA.

The term "developed" refers to both:

(1) development for new code for the OpenMediaCheck conformance checker,

(2) contributions to third party software that is used in the OpenMediaCheck conformance checker to perform its function. E.g. when utilising open source work practices developers typically contribute bug fixes (perhaps a few lines of code) to an existing project.

The term “used" refers both to:

(3) use of a third party Open Source project in the OpenMediaCheck conformance checker to perform its function,

(4) software used to develop, maintain, test and operate the OpenMediaCheck project as a whole i.c. software for developing and maintaining the source code of the OpenMediaCheck conformance checker, testing the OpenMediaCheck conformance checker and managing the open source community.

The Evaluation Committee expects that:

(1) new code developed for the OpenMediaCheck conformance checker,

(2) contributions to third party software used in the OpenMediaCheck conformance checker to perform its function, and

(3) third party software used in the OpenMediaCheck conformance checker to perform its function, must all be licensed under both "GPLv3 or later" and "MPLv2 or later".

Hence (4) software used to develop, maintain, test and operate the OpenMediaCheck project as a whole should be licensed under a generally recognized open source software license, compatible with the license granted under the Agreement (cf. par. 17.5 of the Framework Agreement).. However, the Evaluation Committee does not expect software for creating test files to be available under specific Open source licenses and acknowledges that the corpus of test files to be used for testing the OpenMediaCheck conformance checker preferably originates from a wide range of producing

software.

In the reply to the Request for Clarification 28/8/2014, you confirmed that *“all shell and components developed for PREFORMA will be GPLv3 or later" (most probably) or “MPLv2 or Later" (only if required)." And further that “the components will use internally the OpenJPEG library (as a BSD). We have no plan to rewrite a new version of OpenJPEG in a GPL or MPL version."*

In the reply to the questions of the Hearing on 19/9/2014, you said that the OpenJpeg libraries are soon to be acknowledged by ISO as the reference implementation for the JPEG2000 core coding system, which should ensure that implementing JPEG2000 will be possible on a royalty free basis.

The Evaluation Committee accepts the use of the BSD licensed OpenJpeg library for developing and testing the OpenMediaCheck conformance checker, which is in line with par. 17.5 of the Framework Agreement:

“All third party software (including libraries) required to develop, maintain, test and operate the Project, shall be freely available in open source form under a generally recognized free software licenses compatible with the license granted under the Agreement."

In addition, the Evaluation Committee acknowledges that the OpenJpeg library will be published as the reference implementation for the ISO 15444-1. The Evaluation Committee acknowledges that this will have a positive impact on the sustainability of the OpenJpeg community and the legal protection for memory institutions. Hence, the Evaluation Committee accepts the internal use of the BSD licensed OpenJpeg library for enabling the OpenMediaCheck to read JPEG2000 files.

However, the Evaluation Committee emphasizes that it is essential that other third party source code used for the OpenMediaCheck conformance checker does adhere to the IPR model set forth in the Invitation to Tender, i.e. licensed under two specific Open Source licenses ("GPLv3 or later" and "MPLv2 or later").

Can you formally confirm that you will comply with the IPR model for respectively the OpenMediaCheck conformance checker and OpenMediaCheck project as described in the preceding paragraphs?

In reply to this question on 21/10/2014, you have stated that:

UCL acknowledges that the Evaluation Committee accepts the use of the BSD-licensed OpenJPEG library and emphasizes that if bugs are to be found in the library while integrating it in the OpenMediaCheck conformance checker, bugfixes might be contributed to the library. If so, these contributions will follow the same path as other contributions and will be made under BSD license, as there is no plan to manage different licenses inside OpenJPEG source files.

UCL acknowledges that all software used to develop, maintain, test and operate should be licensed under a generally recognized open source license but would like to draw the attention of the Evaluation Committee that GitHub, the platform given as an example in the Challenge Brief to maintain the open-source PREFORMA projects is a freely available platform hosting open-source projects, but it is not itself an open-source platform. The same goes for GoogleCode, currently hosting the OpenJPEG project. Could you clarify if there is any issue in using these hosting platforms and the tools they propose?

The two above remarks being taken into account, UCL formally confirms that all other source code developed and used in the OpenMediaCheck Conformance Checker and OpenMediaCheck project will be licensed under two specific Open Source licenses ("GPLv3 or later" and "MPLv2 or

later").

In reply to your question on the use of platforms for hosting open source code:

The Evaluation Committee expects that the environment for building the code is open source. Hence, source code can hosted using common and freely available third-party platforms (e.g. GitHub, GoogleCode), although these platforms are not necessarily open source.

A.6.3 Adherence to License Requirements for All Digital Assets Developed During the PREFORMA Project

Unfortunately, after publication of the PREFORMA tender, we discovered an inconsistency between the PREFORMA Invitation to Tender and the PREFORMA Challenge Brief. Where the Minimal Requirements of the Invitation to Tender require tenderers to make all digital assets developed during the project available under the CC-BY v4.0 license, the Challenge Brief suggests using the CC-BY-SA license.

In the Request for Clarification on the license requirements for digital assets, we have confirm that the use of the CC-BY v4.0 license is mandatory, since this license in particular ensures the development and availability of synthetic files for testing the different conformance checkers developed by the PREFORMA project.

In the reply to this Request for Clarification, you have stated that *"all digital assets developed during the PREFORMA project (incl. project deliverables and test files) will be provided under the open access license Creative Commons CC-BY v4.0. The above sentence has been approved by us and our two subcontractors Skemmi and IntoPIX"*.

Could you hereby formally confirm this statement?

In reply to this question on 21/10/2014, you have stated:

Yes, UCL hereby formally confirms this statement.

A.6.4 Advancing the Open Source Community for OpenMediaCheck

The Evaluation Committee expressed the concern that there is a lack of information in the proposal how the OpenMediaCheck project will be maintained as a long-term open source project.

In the reply to the questions of the Hearing, you have explained how you will dedicate a budget for a community manager for dealing with all contributions coming from the community , in particular the follow up of unpaid contributors. And you have pointed to the experience you have with maintenance of other open source projects.

For the Evaluation Committee it is critical that the tenderer is able to develop and grow an active Open Source community. From the information provided in response to the questions asked during the hearing we note that the tenderer claims to have "learned how to build an open source community".

In light of the limited activity after ten years of activity in the OpenJPEG project (e.g. for the last 12 months only two contributors contributed 99% of all commits, and of these two a person involved in the tender has contributed 12% of all commits) and the claimed support from ISO and other organisations, what resources have been attracted to achieve the outcome as it currently stands in the OpenJPEG project? What is the most important lesson learnt from the limited participation and

activity in the development community in the OpenJPEG project and what will be done differently to engage more active contributors in the open source community?

In reply to this question on 21/10/2014, you have stated:

UCL acknowledges the concern expressed by the Evaluation Committee about how the OpenMediaCheck project will be maintained as a long-term open-source project.

First of all, UCL would like to give some details to the Evaluation Committee on how the OpenJPEG project is currently managed. Very few people have actually commit rights in the project. These are Antonin Descampe (the OpenJPEG maintainer and one of the key person involved in this tender) and Mathieu Malaterre (one of the oldest OpenJPEG contributor). Among the 664 members of the OpenJPEG mailing-list, many of them are contributing to the project, either by submitting an issue, suggesting an enhancement, or uploading a patch (see some statistics about OpenJPEG hereunder(*)). Once a patch has been reviewed and tested against the test suite, it is applied by one of the committers. When Antonin Descampe managed last year to have ISO adopt OpenJPEG as its reference implementation for JPEG 2000 Part-1 (15444-1:2004), he found punctual funding to pay Mathieu Malaterre to fix bugs in the library, handle many of the issues raised by unpaid contributors and ensure conformance with 15444-1. This explains the repartition of commits over the last year.

But still, while there are more than 2 contributors, the community of active OpenJPEG contributors is still small compared to what it could be, given the wide usage of JPEG 2000 in broadcast, digital cinema, and archive worlds (to cite a few). This leads us to the main lesson we have learned over the last ten years: the importance of having a budget dedicated to the community management. Since 2003, OpenJPEG has only been very punctually funded, almost always for technical tasks. Luckily, since the recognition by ISO, Antonin Descampe is allowed to dedicate a small part of his work time to the project, so the situation is changing for OpenJPEG.

In the context of OpenMediaCheck, community management will imply following up unpaid contributors, make regular releases, guarantee an up-to-date documentation, but also make of the mailing-list a place where people can expect answers from archival and compression experts, and not only from developers. This will also imply a better and wider communication around the project, through social network tools (twitter for instance), a visible and easily reachable website, participation to conference and workshops in the archive fields. Actually, we have already started as Antonin Descampe will participate to a workshop from the Digital Preservation Coalition, November 10th in London (http://www.dpconline.org/events/details/83-JP2000?xref=97). He will give a presentation about OpenJPEG in the archive field and will therefore talk about the PREFORMA project.

——————————— (*) As an annex, hereunder are some facts and statistics about the OpenJPEG project:

- *Well-known projects like ghostscript, chromium, imagemagick and debian include the OpenJPEG library.*
- *The last OpenJPEG release (2.1.0 April 2014) has an average of 792 downloads each week, and previous version 1.5.2 has 650 downloads each week.*
- *The website has an average of 8500 visitors each month, among which 57% are new visitors.*

- *The mailing-list has 664 members, with an average of 5 additional members each month.*

Another important aspect of the R&D work in PREFORMA is to improve the quality of the technical specifications of the file format. As JPEG 2000 is developed and controlled by an industry consortium (with links to ISO and ITU-T) it is necessary for the tenderer to establish and participate in processes with all relevant organisations for improving the quality of the technical specification of the file format (i.e. part 1 of JPEG 2000). As no budget seems to have been allocated for membership fees and such participation we would like to clarify:

Can you please clarify that your organisation is already a member and has access to all the organisations which need to be influenced by sending us a copy of your membership? In case your organisation is not currently a member (and thereby lacks access for providing the interaction necessary for undertaking the work in PREFORMA) can you please clarify that the budget you have allocated for your membership and participation in ISO and ITU-T (and other relevant fora for JPEG 2000) includes all costs for the time period during which the developed software will be used by sending us details concerning the yearly (and total) costs for such participation?

In reply to this question on 21/10/2014, you have stated:

As indicated in the attached lists (printed from the ISO website), IntoPIX is a member of JPEG and MPEG committees, through NBN Committee (National Belgian Normalisation Bureau). UCL and IntoPIX regularly participate to JPEG meetings since 10 years. UCL because it has a strong expertise in image compression and intoPIX because its core technology is based on JPEG 2000. This negotiation report is actually answered from Strasbourg, where the joint JPEG-MPEG meeting takes place. No budget has been allocated for membership fees or participation to meetings in the OpenMediaCheck project because these costs are currently taken care by other budget lines. If the Evaluation Committee needs a copy of the intoPIX NBN membership, we will be happy to provide one.

A.6.5 Reducing the Price

As defined in the Invitation to tender, the total budget available for Phase I of the PREFORMA project is 390.000 euro. Tenderers have been invited in the order defined in the ranking, starting with the first in the ranking, then second, third, etc. adding the proposed price for each proposal until the available budget of 390.000 euro has been surpassed.

The OpenMediaCheck proposal has been ranked sixth and surpassed the available budget with 14.523 euro. This means that the PREFORMA Consortium has a budget available for the proposal ranked sixth of maximum 79.951,79 euro.

Hence, the PREFORMA Consortium would like to ask UCL to consider lowering the proposed price for the OpenMediaCheck project to maximum 79.951,79 euro, in order to allow the PREFORMA Consortium to grant the OpenMediaCheck project as the sixth project in the PREFORMA PCP, without exceeding the total budget of 390.000 euro for Phase I.

In reply to this question on 21/10/2014, you have stated:

UCL accepts to lower the proposed price to 79 951 euros.

The updated fixed price breakdown is:

Labour Price	Unit Price (cost per month)	Quantity	Total Price (€)
1. UCL Descampe (senior researcher)	7934	2	15868
2. UCL Lugan (senior researcher)	8727.5	2	17455
3. Skemmi subcontractor (senior researcher)	10833	2	21666
4. IntoPIX subcontractor (senior researcher)	10579	2	21158
Materials	-	-	-
Capital Equipment	-	-	-
Travel (by UCL or Skemmi subcontractor)	1266	3	3804
Other (specify)	-	-	-
TOTAL PRICE (excl. VAT)	-	-	**79951**

A.6.6 Project Monitoring and Assessment

In order for PREFORMA Consortium to be able to assess the results of the project, you are therefore requested to include among your deliverables the following reports:

- Two interim reports:
  - A “Program specification report" (due by the end of December 2014), which describes the intended behaviour of the software documented by use cases, application scenarios, etc. (functional specification)
  - A “Software architecture report" (due by the end of February 2014), which describes the structure of the different components and how they are connected to each other (technical specification).
- An End of Design Phase 1 Report, within 14 days of the Completion Date. The End of Design Phase 1 Report shall include the data, methods, results and final conclusions together with management information and any other information relating to the Project up to the Completion Date, and complements the two interim reports listed above.

Templates for the reports mentioned above will soon be made available to the suppliers by the PREFORMA Consortium.

Furthermore, a physical workshop has been planned at the end of Design Phase 1 (beginning of March 2015), probably in Brussels, to allow you (and all the other suppliers) to present to the PREFORMA Consortium the results of the design phase 1. This physical workshop will be part of the assessment of the successful completion of the first design phase. Attendance to this meeting is mandatory and the travel costs should be covered by the suppliers themselves.

In reply to this question on 21/10/2014, you have stated that:

UCL agrees to the negotiation report addendum about deliverables of Phase-1.

A.7 VeraPDFa

The objective of this negotiation is to formally clarify the possible incongruities which the evaluation committee has identified between the VeraPDFa proposal and the requirements of the Invitation to

Tender and the Challenge Brief and agree on how these issues must be addressed in Phase I of the PREFORMA project. This formal clarification seeks:

- to ensure that the Contractor has fully understood the issues raised by the Evaluation Committee
- to obtain the commitment of the Contractor to research the issues as agreed in the negotiation,
- to obtain the commitment of the Contractor to resolve the issues as agreed in the negotiation,
- to dedicate the responsibility to perform the R&D in line with the requirements of the ITT and the Challenge Brief to the Contractor

Some of the issues listed below have already been discussed through the requests for clarification and the hearing. For the sake of completeness, we have included a report of the discussion so far.

Next three issues raised by the Evaluation Committee should be clarified and agreed upon by the Contractor.

A.7.1 Adherence to License Requirements for the Software Developed and Used in the PREFORMA Project

The Evaluation Committee expressed the concern that the license policy as described in the VeraPDFa proposal is not fully compliant with the license model required by the Invitation to Tender.

PREFORMA has minimum requirements concerning use of two specific Open Source licenses for all software developed and used ("GPLv3 or later" and "MPLv2 or later"). This choice is based on extensive prior research and for PREFORMA this is important for a number of reasons (including: a future proof software; licensing issues to allow integration and distribution; sustainability of communities; legal protection for memory institutions; etc.). In order to clarify the licensing conditions for software, as expressed in Section 5.1 of the Invitation to Tender, you need to confirm that you intend to meet the minimum requirements for licensing of all software developed and used in PREFORMA.

As for the requirement for all software developed, you have confirmed in the reply to the Request for Clarification on 4/9/2014 that *“all software developed will of course be licensed under the two specific open source licenses"*.

As for the requirement for all software used, you have asked two additional questions to the Evaluation Committee:

1. Please could you confirm how the term "software developed and used" is being interpreted in your question?

The term "developed" refers to both:

(1) development for new code for the VeraPDFa conformance checker,

(2) contributions to third party software under the same licenses that is used in the conformance checker to perform its function. E.g. when utilising open source work practices developers typically contribute bug fixes (perhaps a few lines of code) to an existing project

The term “used" refers to both:

(3) use of a third party Open Source project in the VeraPDFa conformance checker to perform its function,

(4) software used to develop, maintain, test and operate the VeraPDFa project as a whole. i.c. software for developing and maintaining the source code of the VeraPDFa conformance checker, testing the VeraPDFa conformance checker and managing the open source community.

2. And also clarify the apparent difference between the Invitation to Tender 5.1 (pg 16) which you quote and the Framework Agreement 17.5 (pg 16) which is referenced from the Invitation to Tender section 8?

The context and goal for development of software in the PREFORMA project is to establish long-term sustainable software systems.

The requirements from the ITT stem from the concern that using other licenses for the code of the VeraPDFa conformance checker in combination with licenses required by PREFORMA may cause a number of problems, including:

- other licenses do not provide the necessary legal protection;
- inhibiting a future-proof solution (in that dependencies to code provided under other licenses may not necessary be possible to use with later versions of the two core licenses

This is why we have included "...or later" for both GPLv3 and MPLv2) in the Invitation to Tender.

The choice of "GPLv3 or later" will minimise risks for memory institutions. If a file format is provided under conditions which imply that it can be implemented in a software system and provided (on an open platform) under the "GPLv3 or later" license, the PREFORMA consortium minimise the (legal) risk for not being able to use, evolve and redistribute the software over very long life-cycles.

The choice of "MPLv2 or later" allows memory institutions full flexibility in terms of integration of developed software with their legacy systems, something which may become an issue if the PREFORMA project would only have selected the "GPLv3 or later" alternative.

This is in contrast with several permissive Open Source licenses (e.g. BSD which lacks patent clauses) and such would expose memory institutions to significant legal risks related to patent infringements and thereby no protection against legal threats.

Therefore, the Evaluation Committee expects that:

(1) new code developed for the VeraPDFa conformance checker

(2) contributions to third party software used in the VeraPDFa conformance checker to perform its function, and

(3) third party software used in the VeraPDFa conformance checker to perform its function must all be licensed under both "GPLv3 or later" and "MPLv2 or later".

Hence (4) software used to develop, maintain, test and operate the VeraPDFa project as a whole should be licensed under a generally recognized open source software license, compatible with the license granted under the Agreement (cf. par. 17.5 of the Framework Agreement).

The Evaluation Committee expects that the environment for building the code is open source. Hence, source code can hosted using common and freely available third-party platforms (e.g. GitHub, GoogleCode), although these platforms are not necessarily open source.

Furthermore, the Evaluation Committee does not expect software for creating test files to be available under specific Open source licenses and acknowledges that the corpus of test files to

be used for testing the VeraPDFa conformance checker preferably originates from a wide range of producing software.

The Evaluation Committee considers the analysis of the available software as part of the design phase. It welcomes the initial analysis included in the proposal and the proposal for a full legal analysis in Phase I. This analysis should clarify whether re-use of third-party software available or 'greenfield' development is the most appropriate solution.

In reply to the negotiation report, you have confirmed that you are *"confident that it will be possible to resolve the licensing issues, and will be happy to supply full legal analysis with the architecture in phase 1, in support of the proposed approach."*

The Evaluation Committee will only take a decision on the most appropriate approach at the end of Phase 1, based on the design for the VeraPDFa tool.

A.7.2 Adherence to License Requirements for All Digital Assets Developed During the PREFORMA Project

Unfortunately, after publication of the PREFORMA tender, we discovered an inconsistency between the PREFORMA Invitation to Tender and the PREFORMA Challenge Brief. Where the Minimal Requirements of the Invitation to Tender require tenderers to make all digital assets developed during the project available under the CC-BY v4.0 license, the Challenge Brief suggests using the CC-BY-SA license.

In the Request for Clarification on the license requirements for digital assets, we have confirmed that the use of the CC-BY v4.0 license is mandatory, since this license in particular ensures the development and availability of synthetic files for testing the different conformance checkers developed by the PREFORMA project.

In the reply to this Request for Clarification on 17/9/2014, you confirmed that you *"will use the CC-BY 4.0 licence instead of the CC-BY-SA licence for all digital assets developed during the project (including deliverables and test corpora)."*

A.7.3 Project Monitoring and Assessment

As defined in the Framework Agreement (see Articles 14 and 15), the progress of the Project will be reviewed periodically by the PREFORMA Consortium against the specifications detailed in the Invitation to Tender and the Challenge Brief. In order for PREFORMA Consortium to be able to assess the results of the project, you are therefore requested to include among your deliverables the following reports:

- Two interim reports:
  - A "Program specification report" (due by the end of December 2014), which describes the intended behaviour of the software documented by use cases, application scenarios, etc. (functional specification)
  - A "Software architecture report" (due by the end of February 2014), which describes the structure of the different components and how they are connected to each other (technical specification).

- An End of Design Phase 1 Report, within 14 days of the Completion Date. The End of Design Phase 1 Report shall include the data, methods, results and final conclusions together with management information and any other information relating to the Project up to the Completion Date, and complements the two interim reports listed above.

Templates for the reports mentioned above will soon be made available to the suppliers by the PREFORMA Consortium.

Furthermore, a physical workshop has been planned at the end of Design Phase 1 (beginning of March 2015), probably in Brussels, to allow you (and all the other suppliers) to present to the PREFORMA Consortium the results of the design phase 1. This physical workshop will be part of the assessment of the successful completion of the first design phase. Attendance to this meeting is mandatory and the travel costs should be covered by the suppliers themselves.

In reply to this request on 20/10/2014, you have asked following questions:

do note that this introduces new conditions which were not mentioned in the Invitation to Tender or the Challenge Brief. Specifically, the requirement to produce the 'program specification report' by December 2014. This was not anticipated in our proposal, as our expectation was that many of the use cases and functional requirements are presented already in the Invitation to Tender and the Challenge Brief.

The interim reports were mentioned already in the Framework Agreement, Article 14.2 "The Contractor shall provide an interim report when reasonably required to do so by the Authority. The interim report shall be in a form and otherwise in compliance with the guidance notes issued by the Authority's Representative as amended from time to time and shall detail all Data, methods, Results and provisional conclusions together with management information and any other information relating to the Project."

The Evaluation Committee now wishes to further detail the reporting process in order to bring the project plans of the the invited tenderers in line with each other.

Can you confirm

- whether this relates only to the shell component, as this is the user-facing component of the conformance checker?

The 'program specification report' relates to all components that are directly or indirectly linked to user activities. Indeed, since the shell component is the user-facing component, the functionality of the Shell is the main subject of the program specification report.

- whether you are expecting this to be based on the requirements already presented in the Invitation to Tender and Challenge Brief?

The requirements in the Invitation To Tender and Challenge Brief define the framework for the functional and technical requirements. The Evaluation Committee expects tenderers to make use cases and application scenarios more concrete. The level of concreteness and appropriateness will be subject of the evaluation process after phase 1.

- whether we are able to modify this specification during phase 2, in response to additional requirements from future adopters and integrators of the conformance checker with other products - we will be gathering requirements from these users in focus groups during the first half of phase 2, according to our plan for community engagement?

The supplier consortium is of course able to update the specifications in design phase 2 according to the reviewers' comments, the PREFORMA comments, the findings of the memory institutions, the test and demonstration data sets, and also recent developments in the domain.

In case we as PREFORMA do see an urgent need to specific the pre-set requirements, we will do so and announce this to the suppliers. As this will be done in the following contract phase, it does not affect the current negotiation and the related budget planning.