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|  | Moving Picture, Audio and Data Coding by Artificial Intelligence  www.mpai.community |

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| **Public document** | |
| **N202** | 2021/03/17 |
| **Source** | General Assembly #6 (MPAI-6) |
| **Title** | MPAI-CUI Call for Technologies |
| **Target** | MPAI Members |

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# Introduction

Moving Picture, Audio and Data Coding by Artificial Intelligence (MPAI) is an international non-profit organisation with the mission to develop standards for Artificial Intelligence (AI) enabled digital data coding and for technologies that facilitate integration of data coding components into ICT systems. With the mechanism of Framework Licences, MPAI seeks to attach clear IPR licen­sing frameworks to its standards.

MPAI has found that the application area called “Compression and Understanding of Industrial Data” is particul­arly relevant for MPAI standardisation because AI allows for substantial reduction of the amount of information produced by companies and for more in-depth analysis of the data to be carried out.

Therefore, MPAI intends to develop a standard – to be called MPAI-CUI – that will provide standard tech­nologies to implement several Use Cases, the first of which is:

1. AI-based Performance Prediction (APP)

This document is a Call for Technologies (CfT) that

1. Satisfy the [MPAI-CUI Functional Requirements](https://mpai.community/standards/mpai-cui/#UCFR) (N200) [4] and
2. Are released according to the [MPAI-CUI Framework Licence](https://mpai.community/standards/mpai-cui/#FWL) (N202) [5], if selected by MPAI for inclusion in the MPAI-CUI standard.

The standard will be developed with the following guidelines:

1. To satisfy the [Functional Requirements](https://mpai.community/standards/mpai-cui/#UCFR) (N200) [4]. In the future, MPAI may decide to extend MPAI-CUI to support other Use Cases.
2. To be suitable for implementation as AI Modules (AIM) conforming to the MPAI AI Framework (MPAI-AIF) standard which is being based on the responses to the [Call for Technologies](https://mpai.community/standards/mpai-aif/#Technologies) (N100) [1] satisfying the [MPAI-AIF Functional Requirements](https://mpai.community/standards/mpai-aif/#Requirements) (N74) [1].

Rather than follow the approach of defining end-to-end systems, MPAI has decided to base its application standards on the AIM and AIF notions. The AIF functional requirements have been identified in [1], while the AIM requirements are Use Case-specific. It has done so because:

1. AIMs allow the reduction of a large problem to a set of smaller problems.
2. AIMs can be independently developed and made available to an open competitive market.
3. An implementor can build a sophisticated and complex system with potentially limited know­ledge of all the tech­nologies required by the system.
4. MPAI systems are inherently explainable.
5. MPAI systems allow for competitive comparisons of functionally equivalent AIMs.

Respondents should be aware that:

1. The currently addressed MPAI-CUI Use Case and the AIM internals will be *non-normative.*
2. The input and output interfaces of the AIMs, whose requirements have been derived to support the Use Case, will be *normative*.

**Therefore, the scope of this Call for Technologies is restricted to technologies required to implement the input and output interfaces of the AIMs identified in N200** [4]**.**

However, MPAI invites comments on any technology or architectural component identified in N200, specifically,

1. Additions or removals of input/output data to the identified AIMs with justification of the changes and identification of data formats required by the new input/output signals.
2. Possible alternative partitioning of the AIMs implementing the Use Case providing:
   1. Arguments in support of the proposed partitioning.
   2. Detailed specifications of the input and output data of the proposed new AIMs.
3. New fully described Use Cases.

All parties who believe they have relevant technologies satisfying all or most of the requirements of the Use Case described in N200 are invited to submit proposals for consid­eration by MPAI. MPAI membership is not a prerequisite for responding to this CfT. However, proponents should be aware that, *if their proposal or part thereof is accepted for inclusion in the MPAI-CUI standard*, they shall immediately join MPAI, or their accepted technologies will be discarded.

MPAI will select the most suitable technologies based on their technical merits for inclusion in MPAI-CUI. However, MPAI in not obligated, by virtue of this CfT, to select a particular tech­nology or to select any technology if those submitted are found inadequate.

Submissions are due on 2021/05/10T23:59 UTC and should be sent to the MPAI secretariat ([secretariat@mpai.community](mailto:secretariat@mpai.community)). The secretariat will acknowledge receipt of the submissions via email. Submissions will be reviewed according to the schedule that the 8th MPAI General Assembly (MPAI-8) will define at its online meeting on 2021/05/12. Please contact the MPAI secretariat ([secretariat@mpai.community](mailto:secretariat@mpai.community)),for details on how submitters who are not MPAI members can attend the said review.

# How to submit a response

Those planning to respond to this Call for Technologies are:

1. Advised that online events will be held on 2021/03/31 and 2021/04/07 to present the MPAI-CUI Call for Technologies and respond to questions. Logistic information on these events will be posted on the [MPAI web site](https://mpai.community/standards/calls-for-technologies/).
2. Requested to communicate their intention to respond to this CfT with an initial version of the form of Annex A to the MPAI secretariat ([secretariat@mpai.community](mailto:secretariat@mpai.community)) by 2021/04/13. A potential submitter making a communication using the said form is expected but not required to actually make a submission. A submission will be accepted even if the submitter did not communicate their intention to submit a response by the said date.
3. Advised to visit regularly the [MPAI web site](https://mpai.community/standards/calls-for-technologies/) where relevant information will be posted.

Responses to this MPAI-CUI CfT shall/may include the elements described in *Table 1*:

*Table 1 – Mandatory and optional elements of a response*

|  |  |
| --- | --- |
| **Item** | **Status** |
| Detailed documentation describing the proposed technologies | mandatory |
| The final version of Annex A | mandatory |
| The text of Annex B duly filled out with the table indicating which requirements identified in MPAI N200 [4] are satisfied. If all Functional Requirements are not satisfied, this should be explained. | mandatory |
| Comments on the completeness and appropriateness of the Functional Requir­ements and any motivated suggestion to amend or extend them. | optional |
| A preliminary demonstration, with a detailed document describing it. | optional |
| Any other additional relevant information that may help evaluate the submission, such as additional use cases. | optional |
| The text of Annex E. | mandatory |

Respondents are invited to take advantage of the check list of Annex C before submitting their response and filling out Annex A.

Respondents are requested to present their submission (mandatory) at a meeting by teleconference that the MPAI Secretariat will properly announce to submitters. If no presenter will attend the meeting, the proposal will be discarded.

Respondents are advised that, *upon acceptance by MPAI of their submission in whole or in part for further evaluation*, MPAI will require that:

* A working implementation, including source code – to be used in the development of the MPAI-CUI Reference Software and later publication as a standard by MPAI – be made available before the technology is accepted for inclusion in the MPAI-CUI standard. Software may be written in a programming language that can be compiled or interpreted or in a hardware description language.
* The working implementation be suitable for operation in the MPAI AI Framework (MPAI-AIF).
* A non-MPAI member immediately join MPAI. If the non-MPAI memberelects not to do so, their submission will be discarded. Direction on how to join MPAI can be found [online](https://mpai.community/how-to-join/join/).

Further information on MPAI can be obtained from the [MPAI website](https://www.mpai.community).

# Evaluation Criteria and Procedure

Proposals will be assessed using the following process:

1. Evaluation panel is created from:
   1. All CUI-DC members attending.
   2. Non-MPAI members who are respondents.
   3. Non respondents/non MPAI member experts invited in a consulting capacity.
2. No one from 1.1.-1.2. will be denied membership in the Evaluation panel.
3. Respondents present their proposals.
4. Evaluation Panel members ask questions.
5. If required subjective and/or objective tests are carried out:
   1. Define required tests.
   2. Carry out the tests.
   3. Produce report.
6. At least 2 reviewers will be appointed to review & report about specific points in a proposal if required.
7. Evaluation panel members fill out Annex B for each proposal.
8. Respondents respond to evaluations.
9. Proposal evaluation report is produced.

# Expected development timeline

Timeline of the CfT, deadlines and response evaluation:

*Table 2 – Dates and deadlines*

|  |  |  |
| --- | --- | --- |
| **Step** | **Date** | **Meeting** |
| Call for Technologies | 2021/03/17 | MPAI-6 |
| CfT introduction conference call 1 | 2021/03/31T15:00 UTC |  |
| CfT introduction conference call 2 | 2021/04/07T15:00 UTC |  |
| Notification of intention to submit proposal | 2021/04/13T23.59 UTC |  |
| Submission deadline | 2021/05/10T23.59 UTC |  |
| Evaluation of responses will start | 2021/05/12 | MPAI-8 |

Evaluation to be carried out during 2-hour sessions according to the calendar agreed at MPAI-8.

# References

1. MPAI-AIF Use Cases & Functional Requirements, N74; <https://mpai.community/standards/mpai-aif/>
2. MPAI-AIF Framework Licence, MPAI N101; <https://mpai.community/standards/mpai-aif/#Licence>
3. MPAI-AIF Call for Technologies, N100; <https://mpai.community/standards/mpai-aif/#Technologies>
4. MPAI-CUI Use Cases & Functional Requirements; MPAI N200; <https://mpai.community/standards/mpai-cui/#UCFR>
5. MPAI-CUI Framework Licence, MPAI N201; <https://mpai.community/standards/mpai-cui/#Licence>
6. MPAI-CUI Call for Technologies, MPAI N202; <https://mpai.community/standards/mpai-cui/#Technologies>

# Annex A: Information Form

This information form is to be filled in by a Respondent to the MPAI-CUI CfT.

The purpose of this Annex is to collect data that facilitate the organisation of submission evalu­ation. Therefore submitters are requested to only provide such data as Use Case(s) considered, types of technologies proposed, special requirements for (optional) demonstration and any other information that is functional to the evaluation of the submission.

1. Title of the proposal
2. Organisation: company name, position, e-mail of contact person
3. What are the main functionalities of your proposal?
4. Does your proposal provide or describe a formal specification and APIs?
5. Will you provide a demonstration to show how your proposal meets the evaluation criteria?

Parties sending this Annex A are

1. This Annex A should be *only* sent to the Secretariat
2. Points 1., 3., 4., and 5. above will be made known to MPAI members. Point 2. will not be disclosed.
3. The full submissions will be made available to MPAI members after the submission deadline of 2021/04/10.
4. The Secretariat will not accept any confidential inforamtion at the time expression of interest is communicated to the Secretariat.

# Annex B: Evaluation Sheet

NB: This evaluation sheet will be filled out by members of the Evaluation Team.

**Proposal title:**

**Main Functionalities:**

**Response summary:** (a few lines)

**Comments on Relevance to the CfT (Requirements):**

**Comments on possible MPAI-CUI profiles[[1]](#footnote-1)**

**Evaluation table:**

*Table 3 – Assessment of submission features*

|  |  |
| --- | --- |
| Note 1 | The semantics of Submission features is provided by *Table 4* |
| Note 2 | Evaluation elements indicate the elements used by the evaluator in assessing the submission |
| Note 3 | Final Assessment indicates the ultimate assessment based on the Evaluation Elements |

|  |  |  |
| --- | --- | --- |
| **Submission features** | **Evaluation elements** | **Final Assessment** |
| Completeness of description |  |  |
| Understandability |  |  |
| Extensibility |  |  |
| Use of Standard Technology |  |  |
| Efficiency |  |  |
| Test cases |  |  |
| Maturity of reference implementation |  |  |
| Relative complexity |  |  |
| Support of non-MPAI use cases |  |  |

**Content of the criteria table cells:**

Evaluation facts should mention:

1. Not supported / partially supported / fully supported.
2. What supported these facts: submission/presentation/demo.
3. The summary of the facts themselves, e.g., very good in one way, but weak in another.

Final assessment should mention:

1. Possibilities to improve or add to the proposal, e.g., any missing or weak features.
2. How sure the evaluators are, i.e., evidence shown, very likely, very hard to tell, etc.
3. Global evaluation (Not Applicable/ --/ - / + / ++)

**New Use Cases/Requirements Identified:**

(please describe)

**Evaluation summary:**

1. **Main strong points, qualitatively:**
2. **Main weak points, qualitatively:**
3. **Overall evaluation:** (0/1/2/3/4/5)

0: could not be evaluated

1: proposal is not relevant

2: proposal is relevant, but requires significant more work

3: proposal is relevant, but with a few changes

4: proposal has some very good points, so it is a good candidate for standard

5: proposal is superior in its category, very strongly recommended for inclusion in standard

**Additional remarks:** (points of importance not covered above.)

The submission features in *Table 3* are explained in the following *Table 4*.

*Table 4 – Explanation of submission features*

|  |  |
| --- | --- |
| **Submission features** | **Criteria** |
| Completeness of description | Evaluators should   1. Compare the list of requirements (Annex C of the CfT) with the submission. 2. Check if respondents have described in sufficient detail to what part of the requirements their proposal refers to.   NB1: Completeness of a proposal for a Use Case is a merit because reviewers can assess that the components are integrated.  NB2: Submissions will be judged for the merit of what is proposed. A submission on a single technology that is excellent may be considered instead of a submission that is complete but has a less performing technology. |
| Understandability | Evaluators should identify items that are demonstrably unclear (incon­sistencies, sentences with dubious meaning etc.) |
| Extensibility | Evaluators should check if respondent has proposed extensions to the Use Cases.  NB: Extensibility is the capability of the proposed solution to support use cases that are not supported by current requirements. |
| Use of standard technology | Evaluators should check if new technologies are proposed while widely adopted technologies exist. If this is the case, the merit of the new tech­nology shall be proved. |
| Efficiency | Evaluators should assess power consumption, computational speed, computational complexity. |
| Test cases | Evaluators should report whether a proposal contains suggestions for testing the technologies proposed |
| Maturity of reference implementation | Evaluators should assess the maturity of the proposal.  Note 1: Maturity is measured by its completeness, i.e., by disclosing all the necessary information and appropriate parts of the HW/SW implem­entation of the submission.  Note 2: If there are parts of the implementation that are not disclosed but demonstrated, they will be considered if and only if such com­ponents are replicable. |
| Relative complexity | Evaluators should identify issues that would make it difficult to implement the proposal compared to the state of the art. |
| Support of non MPAI-CUI use cases | Evaluators should check whether the technologies proposed can demonstrably be used in other significantly different use cases. |

# Annex C: Requirements check list

Please note the following acronyms

|  |  |
| --- | --- |
| KB | Knowledge Base |
| QF | Query Format |

*Table 5 – List of technologies identified in MPAI-CUI N200 [4]*

Note: The numbers in the first column refer to the section numbers of N200 [4].

|  |  |  |
| --- | --- | --- |
| **Technologies** | | **Response** |
| 4.1.4.1 | Governance data (raw) | Y/N |
| 4.1.4.2 | Financial statement data (raw) | Y/N |
| 4.1.4.3 | Risk assessment technical data (raw) | Y/N |
| 4.1.4.4 | Governance | Y/N |
| 4.1.4.5 | Financial statement | Y/N |
| 4.1.4.6 | Risk assessment technical data | Y/N |
| 4.1.4.7 | Financial features | Y/N |
| 4.1.4.8 | Governance features | Y/N |
| 4.1.4.9 | Severity | Y/N |
| 4.1.4.10 | Decision Tree | Y/N |
| 4.1.4.11 | Default probability | Y/N |
| 4.1.4.12 | Adequacy of organisational model | Y/N |
| 4.1.4.13 | Business continuity index | Y/N |

# Annex D: Technologies that may require specific testing

|  |
| --- |
| Financial features |
| Governance features |
| Decision Tree |

Additional technologies may be identified during the evaluation phase.

# Annex E: Mandatory text in responses

**A response to this MPAI-CUI CfT shall mandatorily include the following text**

*<Company/Member>* submits this technical document in response to [MPAI Call for Technologies for MPAI project MPAI-CUI](https://mpai.community/standards/mpai-cae/#Technologies) (N202).

*<Company/Member>* explicitly agrees to the steps of the MPAI standards development process defined in Annex 1 to the [MPAI Statutes](https://mpai.community/about/statutes/) (N80), in particular *<Company/Member>* declares that  *<Com­pany/Member>* or its successors will make available the terms of the Licence related to its Essential Patents according to the [Framework Licence of MPAI-CUI](https://mpai.community/standards/mpai-cae/#Licence) (N201), alone or jointly with other IPR holders after the approval of the MPAI-CUI Technical Specif­ication by the General Assembly and in no event after commercial implementations of the MPAI-CUI Technical Specification become available on the market.

**In case the respondent is a non-MPAI member, the submission shall mandatorily include the following text**

If (a part of) this submission is identified for inclusion in a specification, *<Company>*  understands that  *<Company>* will be requested to immediately join MPAI and that, if  *<Company>* elects not to join MPAI, this submission will be discarded.

**Subsequent technical contribution shall mandatorily include this text**

*<Member>* submits this document to MPAI-CUI Development Committee (CUI-DC) as a con­tribution to the development of the MPAI-CUI Technical Specification.

*<Member>* explicitly agrees to the steps of the MPAI standards development process defined in Annex 1 to the [MPAI Statutes](https://mpai.community/about/statutes/) (N80), in particular  *<Company>* declares that *<Company>* or its successors will make available the terms of the Licence related to its Essential Patents according to the [Framework Licence of MPAI-CUI](https://mpai.community/standards/mpai-cae/#Licence) (N201), alone or jointly with other IPR holders after the approval of the MPAI-CUI Technical Specification by the General Assembly and in no event after commercial implementations of the MPAI-CUI Technical Specification become available on the market.

1. Profile of a standard is a particular subset of the technologies that are used in a standard and, where applicable, the classes, subsets, options and parameters relevan for the subset [↑](#footnote-ref-1)