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

MPAI Technical Specification

Governance of the MPAI Ecosystem (MPAI-GME)

V2.0

WARNING

Use of the technologies described in this Technical Specification may infringe patents, copyrights, or intellectual property rights of MPAI Members or non-members.

MPAI and its Members accept no responsibility whatsoever for damages or liability, direct or consequential, which may result from the use of this Technical Specification.

Readers are invited to review Notices and Disclaimers.

Technical Specification
Governance of the MPAI Ecosystem (MPAI-GME)
V2.0

Contents

1 Foreword

The international, unaffiliated, non-profit ***Moving Picture, Audio, and Data Coding by Artificial Intelligence (MPAI)*** organisation was established in September 2020 in the context of:

1. **Increasing** use of Artificial Intelligence (AI) technologies applied to a broad range of domains affecting millions of people
2. **Marginal** reliance on standards in the development of those AI applications
3. **Unprecedented** impact exerted by standards on the digital media industry affecting billions of people

believing that AI-based data coding standards will have a similar positive impact on the Information and Communication Technology industry.

The design principles of the MPAI organisation as established by the MPAI Statutes are the development of AI-based Data Coding standards in pursuit of the following policies:

1. Publish upfront clear Intellectual Property Rights licensing frameworks.
2. Adhere to a rigorous standard development process.

3. Be friendly to the AI context but, to the extent possible, remain agnostic to the technology thus allowing developers freedom in the selection of the more appropriate – AI or Data Processing – technologies for their needs.
4. Be attractive to different industries, end users, and regulators.
5. Address five standardisation areas:
    1. *Data Type*, a particular type of Data, e.g., Audio, Visual, Object, Scenes, and Descriptors with as clear semantics as possible.
    2. *Qualifier*, specialised Metadata conveying information on Sub-Types, Formats, and Attributes of a Data Type.
    3. *AI Module* (AIM), processing elements with identified functions and input/output Data Types.
    4. *AI Workflow* (AIW), MPAI-specified configurations of AIMs with identified functions and input/output Data Types.
    5. *AI Framework* (AIF), an environment enabling dynamic configuration, initialisation, execution, and control of AIWs.
6. Provide appropriate Governance of the ecosystem created by MPAI Technical Specifications enabling users to:
    1. *Operate* Reference Software Implementations of MPAI Technical Specifications provided together with Reference Software Specifications
    2. *Test* the conformance of an implementation with a Technical Specification using the Conformance Testing Specification.
    3. *Assess* the performance of an implementation of a Technical Specification using the Performance Assessment Specification.
    4. *Obtain* conforming implementations possibly with a performance assessment report from a trusted source through the MPAI Store.

MPAI operates on four solid pillars:

1. The MPAI Patent Policy specifies the MPAI standard development process and the Framework Licence development guidelines.
2. *Technical Specification: Artificial Intelligence Framework (MPAI-AIF)* V2.1 specifies an environment enabling initialisation, dynamic configuration, and control of AI applications in the standard AI Framework environment depicted in Figure 1. An AI Framework can execute AI applications called AI Workflows (AIW) typically including interconnected AI Modules (AIM). MPAI-AIF supports small- and large-scale high-performance components and promotes solutions with improved explainability.

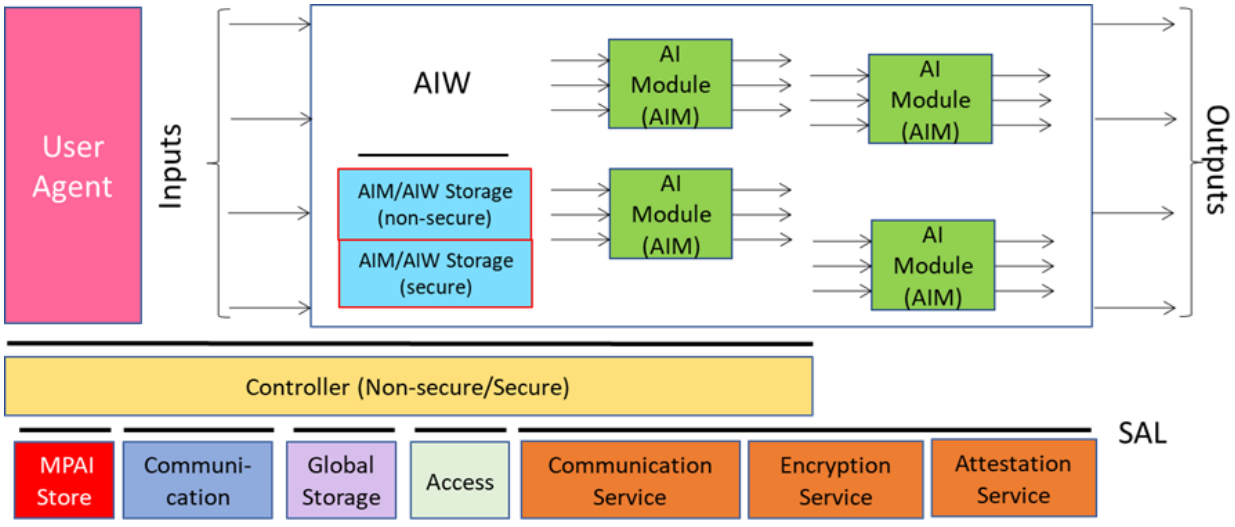

Figure 1 – The AI Framework (MPAI-AIF) V2 Reference Model

3. ***Technical Specification: Data Types, Formats, and Attributes (MPAI-TFA) V1.4*** specifies Qualifiers, a type of metadata supporting the operation of AIMs receiving data from other AIMs or from input data. Qualifiers convey information on Sub-Types (e.g., the type of colour), Formats (e.g., the type of compression and transport), and Attributes (e.g., semantic information in the Content). Although Qualifiers are human-readable, they are only intended to be used by AIMs. Therefore, Text, Speech, Audio, Visual, and other Data received by or exchanged between AIWs and AIMs should be interpreted as being composed of Content (Text, Speech, Audio, and Visual as appropriate) and associated Qualifiers. For instance, a Text Object is composed of Text Data and Text Qualifier. The specification of most MPAI Data Types reflects this point.
4. ***Technical Specification: Governance of the MPAI Ecosystem (MPAI-GME) V2.0*** defines the following elements:
    1. Standards, i.e., the ensemble of Technical Specifications, Reference Software, Conformance Testing, and Performance Assessment.
    2. Developers of MPAI-specified AIMs and Integrators of MPAI-specified AIWS (Implementers).
    3. MPAI Store in charge of making AIMs and AIWs submitted by Implementers available to Integrators and End Users.
    4. Performance Assessors, independent entities assessing the performance of implementations in terms of Reliability, Replicability, Robustness, and Fairness.
    5. End Users.

The interaction between and among actors of the MPAI Ecosystem are depicted in Figure 2.

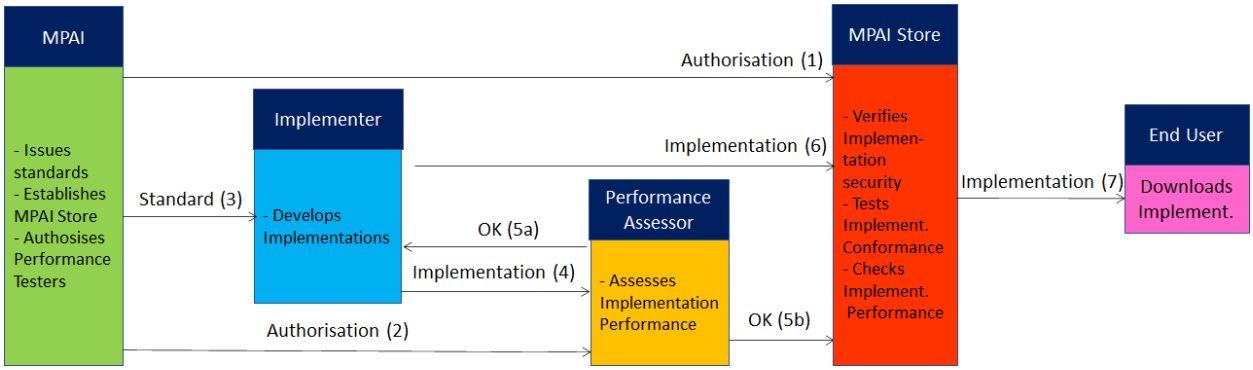

Figure 2 – The MPAI Ecosystem

2 Introduction (informative)

The mission of the international, unaffiliated, not-for-profit Moving Picture, Audio and Data Coding by Artificial Intelligence (MPAI) Standards Developing Organisation is the development of *AI-enabled data coding Technical Specifications* enabling AI-based products, applications, and services qualified by their level of interoperability.

In addition to these MPAI includes, as part of its mission, the development of appropriate Reference Software enabling implementers and general users to evaluate MPAI Technical Specifications and Conformance Testing Specifications providing the means to test the conformity of an Implementation.

As conformity of an Implementation to a Technical Specification does not fully cover all important aspects of an AI-based implementation, MPAI has developed the notion of Performance, defined as a set of attributes, such as:

- *Quality* - measure of how well an implementation performs.

- *Bias* - the performance of an implementation differs for different users and data sources.
- *Legal* compliance - the possibility to use an implementation in a jurisdiction.
- *Ethical* compliance - the performance of an implementation respects an ethical norm.

Therefore, MPAI has decided that Performance Assessment should be added to Technical Specification, Reference Software, and Conformance Assessment. The set of four specification is called MPAI Standard. Of course the different specifications may become available at different times.

So far, the availability of a standard has caused the birth of an ecosystem composed of at least four elements: issuer, implementers, conformance testers, and users of a standard. The case of MPAI Standards is more complex and requires significant extensions. ***Technical Specification: Governance of the MPAI Ecosystem (MPAI-GME) V2.0*** specifies how the MPAI Ecosystem is composed and managed.

In the following, Terms beginning with a capital letter are defined in *Table 1* if they are specific to MPAI-GME V2.0. All MPAI-defined Terms are accessible online.

The chapters and the annexes of this Technical Specification are Normative, unless they are labelled as Informative.

3 Scope

Technical Specification: Governance of the MPAI Ecosystem (MPAI-GME) V2.0 specifies

1. The types of Documents produced by MPAI.
2. The Ecosystem generated by them.
3. The roles of the Actors of the MPAI Ecosystem:
    1. MPAI
    2. Implementers
    3. The MPAI Store
    4. Performance Assessors
    5. Users
4. The Operation of the MPAI Ecosystem.

4 Definitions

The terms whose first letter is a capital letter defined by this document are defined by *Table 1*. Other Terms of general use across MPAI Standards are accessible online.

Table 1 –Terms used in this document

Term	Definition
Accessory Technical Specification	A Technical Specification specifying how to assess the impact of functionalities additional to those specified in a Technical Specification.
Application-oriented Technical Specification	An MPAI Technical Specification designed to enable domain-specific applications.
Conformance	The attribute of an Implementation of being a technically correct reification of a Technical Specification.
Conformance Tester	An entity authorised by MPAI to Test the Conformance of an Implementation.

Conformance Testing Means	Procedures, tools, data sets and/or data set characteristics to Test the Conformance of an Implementation.
Conformance Testing Specification	The Normative document specifying the Means to Test the Conformance of an Implementation.
Data Format	The standard digital representation of Data and their semantics.
Data Semantics	The meaning of Data.
Ecosystem	The ensemble of MPAI, MPAI Store, Implementers, Performance Assessors, and Users of Implementations enabling User to ripe the benefits of Interoperable Implementation.
Explainability	The ability to trace the output of an Implementation back to the inputs that have produced it.
Fairness	The attribute of an Implementation describing to which extent the Implementation does not produce biased or unanticipated results.
Function	The operation of an AIW or an AIM on Input Data as specified by an Application-oriented Specification to produce Output Data.
Grade	The Performance of an Implementation measured against a scale specified in the relevant Performance Assessment Specification.
Implementation	1. An embodiment of the MPAI-AIF Technical Specification. 2. An embodiment of an AIW or AIM of a particular Interoperability Level.
Implementer	A legal entity implementing MPAI Technical Specifications.
ImplementerID (IID)	A unique name assigned by the ImplementerID Registration Authority to an Implementer.
ImplementerID Registration Authority (IIDRA)	The entity authorised by MPAI to assign ImplementerID's to Implementers.
Interoperability	The ability to functionally replace an AIM or an AIW with another AIM having the same Interoperability Level.
Interoperability Level	The attribute of an AIW and its AIMs to be executable in an AIF Implementation and to: 1. Pass the AIF Conformance Testing (Level 1). 2. Pass the Conformance Testing (Level 2) of an Application Standard. 3. Pass the Performance Assessment (Level 3) of an Application Standard.
Means	The procedures, tools, data sets and/or the definition of suitable data sets used to Test the Conformance or Assess the Performance of an implementation.
Performance	The attribute of an Implementation to have Replicability, Robustness, Replicability, and Fairness.
Performance Assessment Specification	The MPAI-produced document that: 1. Specifies the Means to Validate the Replicability of an Implementation. 2. Provides guidelines on how to assess Robustness, Replicability and Fairness of an Implementation.

Performance Assessment Means	Procedures, tools, data sets and/or data set characteristics to Assess the Performance of an Implementation.
Performance Assessor	An entity appointed by MPAI to assess that the Replicability of an Implementation is above Performance of an Implementation is above a Grade specified by a Performance Assessment Specification.
Profile	A particular subset of the technologies that are used in AIF, AIW or AIM and, where applicable, the classes, other subsets, options, and parameters relevant to that subset.
Reference Model	The AIMs and their Connections in an AIW.
Reference Software Specification	The Normative document specifying the characteristics of the associated Reference Software Implementation.
Reference Software Implementation	A technically correct software implementation of a Technical Specification containing source code, or source and compiled code.
Robustness	The attribute of an implementation describing how robust the implementation operates with respect to parameters such as operation time, load scaling
Reputation	The collection of reviews of an Implementation made by Users.
Extensibility	The attribute of an Implementation describing to which confidence degree it can cope with data outside of its stated application scope.
Security Validation	The result of the application of the procedure specified in the MPAI-AIF Conformance Testing on an implementation.
Service Provider	An entrepreneur who offers an Implementation as a service (e.g., a recommendation service) to Users.
Standard	The ensemble of Technical Specification, Reference Software, Conformance Testing and Performance Assessment of an MPAI Standard.
Technical Specification	(Framework) the normative specification of the enabling components of the AI Framework. (Application) the normative specification of the set of AIWs belonging to an application domain along with the AIMs required to Implement the AIWs that includes: 1. The formats of the Input/Output data of the AIWs implementing the AIWs. 2. The Connections of the AIMs of the AIW. 3. The formats of the Input/Output data of the AIMs belonging to the AIW.
Use Case	A particular instance of the Application domain targeted by an Application Standard.
User	A user of an Implementation.
Version	A revision or extension of a Standard or of one of its elements.

5 References

5.1 Normative References

1. MPAI; Technical Specification: AI Framework (MPAI-AIF) V2.2.

2. MPAI; Technical Specification: Data Types, Formats, & Attributes (MPAI-TFA) V1.4.

5.2 Informative References

2. MPAI; The MPAI Statutes; https://mpai.community/about/statutes/.
3. MPAI; The MPAI Patent Policy; https://mpai.community/about/the-mpai-patent-policy/.

6 Documents

6.1 Introduction

The following document types are developed, approved, published, and maintained by MPAI for each of its Standards enabling the MPAI Ecosystem:

1. Technical Specification.
2. Reference Software Specification.
3. Conformance Testing Specification.
4. Performance Assessment Specification.

An MPAI Standard is the collection of the 4 document types that includes at least the first type of document and may additionally include Technical Reports.

6.2 Technical Specifications

6.2.1 Types of Technical Specifications

These are of three types of Standards:

1. *Management-oriented*: address issues regarding the management of Technical Documents, such as this Technical Specification.
2. *System-oriented*: address the context in which Application-Oriented Technical Specifications are handled and executed, such as:
    1. AI Framework
    2. Profiles
    3. Qualifiers
3. *Application-oriented*: are container standards specifying the components of AI Systems whose Implementations are part of the MPAI Ecosystem. An important case is given by Technical Specifications based on the AI Framework.

Application-oriented Technical Specifications include the following chapters:

1. Normative chapters:
    1. Scope
    2. Definitions
    3. References
    4. AI Workflows
    5. AI Modules
    6. Data Types
2. Informative chapters:
    1. Foreword
    2. Introduction

Some application-oriented Technical Specifications may not include specification of AI Workflows or AI Modules.

6.2.2 Development Process

Technical Specification shall include at least the following stages:

1. Development of Use Cases and Functional Requirements.

2. Development of the Technical Specification- and possibly Version-related Framework Licence.
3. Publication of Call for Technologies.
4. Development of Technical Specification.
5. Approval and Publication.

The MPAI Patent Policy details the complete process.

A new Project that is intended to generate a Technical Specification or a Technical Report is assigned a three-character acronym. The name of the Project includes a not-too-large number of words

6.2.3 Meaning of the word "Normative"

The word *normative* implies that an Implementation claiming Conformance to:

1. An *AIW*, shall:
    1. Perform the function specified in the relevant section of the AI Workflows chapter.
    2. Use AIMs connected with the topology and connections conforming with the relevant AIM specifications.
    3. Receive input and produce output data having the formats specified by the relevant Data Type specifications.
2. An *AIM*:
    1. Shall perform the function specified in relevant section of the AI Workflows chapter of the relevant Technical Specification.
    2. May be composed of Sub-AIMs in accordance with the relevant AIM specification when it is a Composite AIM.
    3. Receive and produce data in accordance with the relevant Data Types specifications.
3. A *Data Type*:
    1. Shall have a format conforming with the JSON Schema of the Data Type.
    2. Shall have a Qualifier referenced in the JSON Schema.

6.2.4 Naming

The name of a Technical Specification may be:

1. MPAI-ABC where ABC is the three-character acronym given to the Project.
2. ABC-XYZ where XYZ if the three-character acronym indicating the name of an area of the ABC project.

6.2.5 Publication

It is recommended that, before final publication, a sufficiently mature draft Technical Specification be published for Community Comments on the MPAI website. The Secretary collects comments received before the deadline and forwards it to the relevant Development Committee or Group of the Requirements Standing Committee.

The Technical Specification shall be published on the relevant project page as a pdf file and as connected web pages each including a chapter of the standard.

The cover page or website shall make reference to Notices and Disclaimers.

The Reference Software, Conformance Testing, and Performance Assessment Specification may be published either as an independent document or as part of the relevant Technical Specification.

Per the Procedures of Work of the MPAI Statutes, the Secretariat shall collect the Patent Declarations submitted by Members.

6.2.6 Reference Software Specifications

The Reference Software Specification of a Technical Specification is a Document that provides basic information about, and references, the Reference Software Implementation.

The Reference Software Implementation of an AIW or AIM (in the following "Software") shall display the functionality specified in the relevant Technical Specification and produce Conforming output data when fed with input data that Conform with the relevant Technical Specification. Data is defined as Conforming when it Conforms with the relevant specification in the relevant Conformance Testing Specification.

Software is made available in one or more than one of the following forms:

1. As source or compiled code providing a user experience and/or functionality sufficient to assess the value of the standard.
2. As source code or compiled wrapping access to a third-party service enabling a conforming AIM Implementation (Wrapper AIM).

General notes about Software release:

1. The Software shall be published with the following disclaimers:
    1. The MPAI-ABC or ABC-XYZ Reference Software Implementation, if in source code, is released with the BSD-3-Clause licence.
    2. The purpose of this Reference Software is to provide a working Implementation of MPAI-ABC or ABC-XYZ, not to provide a ready-to-use product.
    3. MPAI disclaims the suitability of the Software for any other purposes and does not guarantee that it is secure.
    4. Use of this Reference Software may require acceptance of licences from the respective copyright holders. Users shall verify that they have the right to use any third-party software required by this Reference Software.
2. If the Software is compiled code, it may not be used in commercial products or services unless the rights holder agrees otherwise.
3. Sample input data or a data generating environment or endpoint for trialling the reference software shall also provided if required to operate the Software.
4. If the Software requires use of a knowledge base, access to a knowledge base conforming with the standard shall be provided.
5. The Software need not pass any clause of the Performance Assessment Specification because its purpose is only to provide an example of a technically correct Implementation.

A Wrapper AIM is governed by the followings clauses:

1. A Wrapper AIM should be accompanied by detailed descriptions and references to any Third-Party Service documentation.
2. The Submitter commits to maintain the Wrapper AIM for 12 months after submission.
3. If the Third-Party Service is discontinued, the Submitter shall make its best effort to find a similar Third-Party Service and develop a new Wrapper AIM .
4. After 12 months, the submitter is not required to maintain the Wrapper AIM.

The Reference Software Specification is usually integrated with the Technical Specification. When it is published as a stand-alone document it shall include:

1. Normative chapters:
    1. Scope.
    2. Definitions.
    3. References.
    4. Architecture and Operation of the Reference Software Implementation.
2. Informative chapters
    1. Foreword.
    2. Introduction.

6.3 Conformance Testing Specifications

A Conformance Testing Specification allows a user to ascertain whether an implementation is a correct embodiment of a Technical Specification. i.e.:

1. If it is an AIW, it can technically replace an equivalent Conforming AIW, i.e. the AIW offers the functionality specified for the AIW and provides Conforming output data when fed with Conforming input data.
2. If it is an AIM, it can technically replace an equivalent Conforming AIM, i.e.:
    1. It offers the functionality specified for the AIM.
    2. Its outputs each conform to the Data Type specified in the relevant standard.
3. If it is Data, it conforms to the Data Type specified in the relevant standard.

MPAI defines 3 Interoperability Levels of an AIW:

Level 1 – The AIW Conforms with the MPAI-AIF Standard.

Level 2 – The AIW Conforms with the MPAI-AIF Standard and an Application-oriented Technical Specification.

Level 3 – The AIW Conforms with the MPAI-AIF Standard, an Application-oriented Technical Specification, and has been assessed for Performance by a Performance Assessor.

The MPAI Store Tests the Conformance of a submitted AIW implementation to properly label it as a Level 1, Level 2, or Level 3 Implementation, and making it available for Distribution.

The Conformance Testing Specification is usually integrated with the Technical Specification. When it is published as a stand-alone document it shall include:

1. Normative chapters:
    1. Scope.
    2. Definitions.
    3. References.
    4. The Means to Test the Conformance of the relevant AIMs and/or AIW.
2. Informative chapters
    1. Foreword.
    2. Introduction.

6.4 Performance Assessment Specification

As specified in Ecosystem, Performance Assessors perform Performance Assessment of Implementations based on Performance Assessment Specification the Implementor makes reference to.

Performance is an umbrella term used to describe a variety of attributes - some specific of the application domain the Implementation intends to address. Therefore, Performance Assessment Specifications provide methods and procedures to measure how well an AIW or an AIM performs its function. Performance of an Implementation includes methods and procedures for all or a subset of the following characteristics:

1. Quality - for instance, how well a Face Identity Recognition AIM recognises faces, how precise or error-free are the changes in a Visual Scene detected by a Visual Change Detection AIM, or how satisfactory are the responses provided by an Answer to Multimodal Question AIW.
2. Robustness - for instance, how robust is the operation of an implementation with respect to duration of operation, load scaling, etc.
3. Extensibility - for instance, the degree of confidence a user can have in an Implementation when it deal with data outside of its stated application scope.
4. Bias: - for instance, how dependent on specific features of the training data is the inference, as in Company Performance Prediction when the accuracy of the prediction may widely change based on the size or the geographic position of a Company; or face recognition in Television Media Analysis.
5. Legality - for instance, in which jurisdictions the use of an AIM or an AIW complies with a regulation, e.g., the European AI Act.
6. Ethics: may indicate the conformity of an AIM or AIW to a target ethical standard.

A Performance Assessment Specification shall:

1. Define which of the six characteristics mentioned above, or any other application-specific instance not listed above, are addressed by the Specification.
2. Include the Means, i.e., procedures, tools, data sets and/or the specification of suitable data sets - for use in Assessing the Performance of an implementation.
3. Specify the minimum amount of information that an Implementer shall provide to the Performance Assessor regarding their Implementation.
4. Specify the nature and minimum amount of feedback that a Performance Assessor shall disclose to an Implementer.

The Performance Assessment Specification is usually integrated with the relevant Technical Specification. When it is published as a stand-alone document it shall include:

1. Normative chapters:
    1. Scope.
    2. Definitions.
    3. References.
    4. Any chapter providing the content of the Performance Assessment.
2. Informative chapters
    1. Foreword.
    2. Introduction.

6.5 Technical Report

Technical Reports are descriptions of contexts, technical issues and possible solutions regarding an application area, such as "implementation guidelines" of a Technical Specification.

A Technical Report is published as a stand-alone document or a set of web pages. It shall include:

1. Normative chapters:
    1. Scope
    2. Definitions.
    3. References
    4. Any chapter providing the content of the Technical Report.
2. Informative chapters
    1. Foreword
    2. Introduction.

7 Ecosystem

7.1 Introduction

The MPAI Ecosystem is specified based on its three components:

1. Players having a role in the Ecosystem.
2. Operation of the Ecosystem
3. Data used in the Ecosystem.

7.2 Ecosystem Players

The MPAI Ecosystem composed of the following cooperating entities:

1. *MPAI*
    1. Acts as the root of trust of the MPAI Ecosystem.
    2. Defines the rules of Governance.
    3. Develops the 4 components of an MPAI Standard.
    4. Assigns the Ecosystem activities of the MPAI Store to a specific company.
    5. Appoints Performance Assessors.

2. *MPAI Store*
    1. Manages the Implementer ID Registration Authority (IIDRA).
    2. Establishes distribution agreements with Implementers.
    3. Tests implementations submitted by implementers for:
        1. Security Validation.
        2. Conformance with MPAI-AIF.
        3. Conformance with an Application-Oriented Technical Specification.
        4. Conformance with an Accessory Specification (if applicable).
    4. May receive and publish notifications from Performance Assessors.
    5. The MPAI Store may record results obtained through a publicly described methodology provided by external experts regarding Performance and post them alongside the metadata of an Implementation.
    6. Labels Implementations as:
        1. Level 1, if 3.1 and 3.2 tests have been passed.
        2. Level 2, if 3.3 tests have been passed.
        3. Level 3, if a Performance Assessor has notified that the Implementation has a Grade above the minimum level.
    7. Posts software Implementations for download.
    8. Manages a reputation system where the MPAI Store publishes reports of their user experience of an Implementation. Moderation is performed when necessary.
    9. The MPAI Store is a not-for-profit commercial organisation according to a mandate received from MPAI.
    10. However, the MPAI Store recovers the costs (e.g., ICT infrastructure, personnel, consultants) deriving from MPAI-related activities from Implementers, Service Providers and Users.
3. *Implementers*
    1. Obtain an Implementer ID (IID).
    2. Make implementations.
    3. Submit implementations to the MPAI Store.
    4. May submit Implementations to Performance Assessors.
4. *Performance Assessors*
    1. Are appointed for a particular domain and Performance category.
    2. Assess the Performance of an Implementation.
    3. May be implementers or qualified companies.
    4. May not Assess the Performance of their Implementations if Implementers.
    5. Appointments are permanent but MPAI may revoke the appointment.
    6. May charge Implementers, Service Providers, and Users for their services.
    7. Maintain confidentiality during Performance Assessment, unless Implementors and Assessors decide otherwise.

Table 1 gives the operations of the actors enabling the MPAI ecosystem to operate.

Table 1 – The players of the MPAI ecosystem

Player	**Role**
MPAI Store	1. Is an independent commercial not-for-profit entity mandated by MPAI. 2. Assigns ImplementerID's to Implementers as ImplementerID Registration Authority. 3. Charges Implementers, Service Providers and Users on a cost recovery basis. 4. Receives Implementations from Implementers. 5. Tests Implementations submitted by Implementers for security and

	Conformance. 6. Receives results of Performance Assessment of Implementations from Performance Assessors. 7. Distributes AIWs and AIMs suitable for execution in AIFs. They may be implementations of MPAI standards or independently developed. 8. Assigns AIWs and AIMs to security experts for testing (either employees or consultants). 9. Receives commercial distribution licences of AIFs, AIWs and AIMs Implementations from Implementers. 10. Distributes to Service Providers and Users Implementations that are approved by security experts and Tested for Conformance after assigning: 1. A Level 1 label to non-MPAI-specified AIWs and AIMs. 2. A Level 2 label to AIWs and AIMs Conforming to an MPAI Application Standard. 3. Assign a Level 3 label to AIWs and AIMs Conforming to an MPAI Application Standard and whose Performance has been Assessed. 11. Makes Implementations available through high availability ICT infrastructure.
Standard developer	An expert contributing to the development of MPAI Standards.
Implementer	An entity providing Implementations of AIFs, AIWs and AIMs.
Performance Assessor	An entity certified by MPAI to determine whether an AIW or AIM: 1. Conforms with one or more MPAI standards. 2. Offers a Performance Grade.
Security expert	An entity authorised by MPAI to develop tests establishing whether an AIF or an AIW or an AIM presents security issues.
Service Provider	An entity running AIWs e.g., a private or public cloud. A Service Provider does not acquire the right to redistribute Implementations.
End User	The ultimate beneficiary of the execution of AIWs. They may execute AIWs and AIMs in a local environment.

7.3 Ecosystem Operation

Figure 1 depicts the operation of the MPAI ecosystem.

Legend OK Passed

$ Transaction

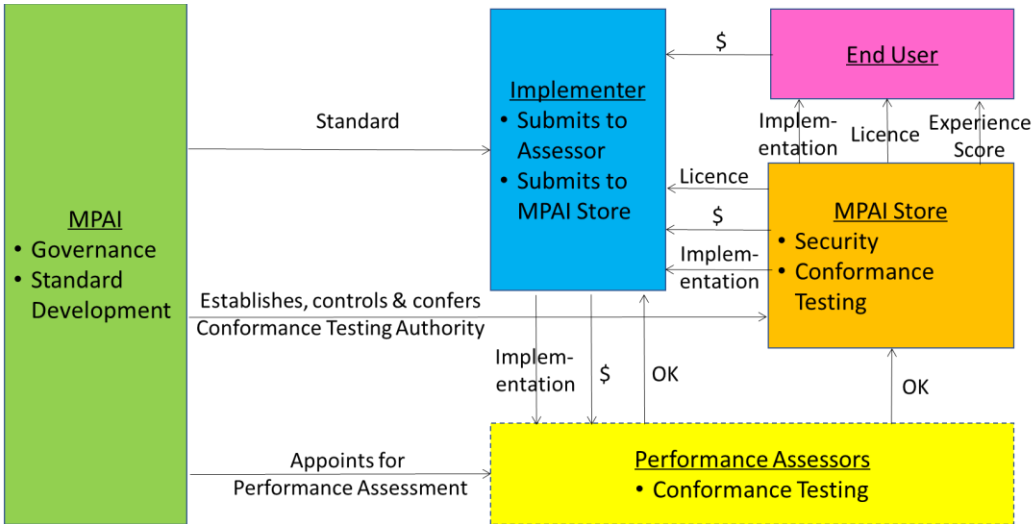

Figure 1 – Operation of the MPAI Ecosystem

7.4 Ecosystem data

Table 2 gives the data types proper of the MPAI ecosystem:

Table 2 – The data types of the MPAI ecosystem

Data type	**Definition**
Conformance data	Data developed by MPAI to test the Conformance of an Implementation. It is defined and its version is controlled by MPAI and freely accessible from the MPAI Store.
Performance data	Data developed or specified by MPAI to assess the Performance of an Implementation. It is version-controlled by MPAI and may be accessible from a qualified third party (e.g., a Performance Assessor).
Implementations	Software implementing AIF, AIWs and AIMs submitted by Implementers and 1. Verified for security issues by MPAI security experts. 2. Tested for Conformance by the MPAI Store. 3. Assessed for Performance upon request of the Implementer. Implementations available on the MPAI Store can be commercial or non-commercial.
Licence	A token describing the rights of a User to an Implementation.