Request for Quotation:

XSD to ADOC Generator

ASAM is looking for a service provider (SP) for ASAM standard specification generation based on schema files. The contents of the schema files are used to fill specific sections within the standard document.

Deadline for submission of quotations:	Feb 13, 2026, EoB
Submit your offer to	offers@asam.net
For questions on ASAM OTX Extensions:	bernd.wenzel@asam.net
For pipeline questions:	jordi.martopawiro@asam.net

1 Statement of Work (SOW)

1.1 Description

Until now, the ASAM/ISO OTX specification was generated by a specific generator from Enterprise Architect (EA) for Microsoft Word. In the future, the XSD files of the ASAM OTX extensions shall serve as the starting point for generating ADOC files.

This request for quotation (RfQ) covers the following aspects:

- Transfer of all structural and textual information from XSD
- Template-based creation of the specification in ADOC
- Visualization of inheritance, aggregations, and compositions

In addition, it is expected that a generator for creating and processing ADOC snippets from XSD content will be provided.

1.2 Timeline

The implementation shall take place within nine calendar months of contracting (expected end of March 2026). The reference for `otxIFD_datatype.xsd` shall be submitted by the service provider six months after award of contract.

After successful delivery, the service provider shall provide maintenance for one year as per request and separate order(s) by ASAM. **A corresponding daily rate shall be specified for this phase.**

2 Task description

2.1 General

The service provider shall report on a regular basis to the project group. The initial cadence will be every two months with more frequent meetings being scheduled towards the end of the contract.

Validation of the work results shall be performed with all ASAM OTX extensions of ASAM OTX Part 4 and Part 5.

`otxIFD_datatypes` inside ASAM OTX Part 4 will be used as exclusive reference.

2.2 Template-based approach

Even though the development of the generator is performed within the scope of the standardization project "ASAM OTX Extensions", the solution developed by the service provider shall be applicable across a wider range of ASAM standards. For this, a template shall be defined for each XSD content fragment. A content fragment can be, for example, an OTX action or an OTX term. The template shall contain all necessary content for the respective fragment (e.g. return type).

The basic idea is that standard-independent generation can take place based on the fragment-specific template. If necessary, additional templates for other standards can be added and implemented generatively in the future. A potential candidate for a first extension of scope is ASAM OpenDRIVE (https://www.asam.net/standards/detail/opendrive/).

Note: The current call for offers is limited to OTX-specific fragments.

The solution concept proposed by the service provider shall be described and presented to the ASAM OTX project group as part of the evaluation stage of the service provider selection process. If the proposed solution requires additions (e.g., special keywords) to the original XSD file before it can be processed, such (manual) changes are permitted as long as the overall structure of the XSD file is not negatively affected. The file must remain compatible with all tooling that is also capable of processing the original file.

The service provider shall manually enrich the XSD files once with information that is currently in the specification for existing XSD fragments, and prepare the XSD so that the effort of formatting in ADOC is minimized.

To enable easy use of literature references in ADOC, the XSD shall use anchor names at such places. The offer shall include a proposal for this requirement.

2.3 Visualization

In the existing documentation inheritance, aggregations and compositions are visualized by figures. These figures were generated from EA. In the future, the base for visualization shall be the XSD content. The minimum required visualization information is:

- Term/Action name,
- Return type,
- Parameter Name,
- Parameter Type,
- Parameter cardinality.

The required visualization is shown in section 2.4.

Each image shall be readable when printed (see ISO DRG working instructions and directives). The provider may offer alternatives to images, like tables or visualization trees. It is also acceptable that a configuration file has to be used for a tbd. graphical tool in which elements to be displayed can be selected via a GUI. In this case, the configuration file for the graphical tool must be created automatically from the XSD information (The generator for the creation of the configuration file shall be part of the service provider's deliverable). Please note, that the graphical tool does not need to be integrated into the pipeline if outputs (png, svg, …) can be created. Typically, figures will only be changed when, for example, new terms, actions, or datatypes are added.

An overview of schema dependencies (Figure Overview OTX schema dependencies, see example in `DataTypes.docx`) is required.

2.4 Specification output and expected visualization

Each OTX extension shall be in its own chapter (as ADOC file).
The following subsections are required (extent may vary depending on the specific extension):

- General
- DataTypes (visualization of inheritance required, properties not necessary)
- Enumerations
- Exceptions (visualization required)
- Variable access (figure shall be replaced by a list of variable types, incl. inheritance)
- Signatures (visualization of aggregations and compositions required)
- Actions (visualization required)
- Terms (visualization required)

The following subsections shall be omitted:

- Declaration and Arguments

Logical grouping is required, as all terms and actions can basically be shown in one image. The sequence, which shall be used for grouping, is for Part 4 as in the ASAM OTX deliverable (Part 4) and for Part 5 in the sequence of ASAM SOVD.

In each subsection the content elements shall be sorted alphabetically and contain the documentation description. Elements shall be placed before attributes. For dereferencing terms, the `valueOf` attribute and the `path` element shall never be shown. In case no further element exists, the whole subsection parameters shall be omitted. All terms, actions, datatypes and signatures shall be linked.

The content from the extension-independent chapters shall be transferred manually to ADOC (e.g. the requirements section, restricted to datatype relevant requirements).

An example `DataTypes.docx` (based on `otxIFD_datatype.xsd`) is available as attachment to this RfQ and shall be used as base reflecting the expectations of the project group.

In case that examples are used (e.g. at actions, terms, general) the following mechanism shall be used inside the XSD:

```
[#code-unique-anchor-name]
.Source code caption
[source, csharp]
----

// The next line performs the SOVD API Method:
GET {base_uri}/apps/WindowControl/data/RearWindows
Data rearWindows = GetData(rearWindowsDataDescriptor);
// Now rearWindows contains the response body from the API
method as JSON Object.

----
```

`xref:code-unique-anchor-name[{code-style}]` shows, the DataDescriptor from either example above can now be used to read the data resource from the entity.

Please note that besides "multiline source code (rule ASM-88 of the ASAM Editorial Guide V1.1.0)" also "single line source code (ASM-43 of the Editorial Guide)" is possible if necessary.

2.5 ASAM OTX checker rules

The ASAM OTX application uses a two-stage approach to ensure the completeness and correctness of the exchange file. The first stage is standard XML schema validation. The second stage is necessary to test restrictions that cannot be checked with standard XML schema validation. Typical constraints that fall into this category are constraints of a semantic rather than syntactic nature. These constraints are formulated as checker rules.

Only documents that have successfully passed both stages are considered fully compliant with the ASAM OTX standard. ASAM has currently defined 70 ASAM OTX checker rules.

The mapping of the ASAM OTX checker rules shall also be considered. This concerns, on the one hand, the referencing of a checker rule (to be considered in the fragment-specific template) and, on the other hand, the description of the checker rules. It shall be clarified whether this is done in a separate file or in the extension-specific file. It should be noted that checker rules within an extension can also originate from other extensions.

The specific checker rules shall be shown block-wise for each
- datatype (before members)
- signature (before parameters)
- action (before parameters)
- and term (after parameters).

Each checker rule inside the specification shall be linked between the places where the rule is used and the place where the rule is defined.

2.6 Infrastructure of ASAM pipeline

ASAM uses the doc-as-code approach for the generation of ASAM standards. Therefore, a pipeline was set up, which shall be used for this project. This pipeline includes a standard template (see `STANDARD_ASCIIDOC-TEMPLATE_BS-Specification_Vx.y.z.pdf`), which shows a raw rendered output (no content in standard specific sections) based on the rules of the ASAM Editorial Guide. The preconfigured pipeline creates an ASAM OTX specification in PDF format. The template provides the complete document frame, including ASAM layout (all necessary style sheets), Table of Content, List of Figures/Tables, and all necessary non specification-specific template chapters. All ADOC files are automatically rendered (with every commit).

The ASAM OTX specification consists of sections that directly represent content from the XSD files of the individual extensions (e.g. `otxIFD_datatype.xsd`) and sections that present extension-independent content (not available in *.xsd, e.g., Extensions overview, Requirements, Terms and Definitions). The content for the extensions (e.g. datatype) shall be created automatically by the generator and integrated in the form of ADOC snippets in the main document. An identical procedure shall be used for all graphical representations.

A separate ADOC file shall be generated for each ASAM OTX extension based on XSD.
For this purpose, the content structure, types, documentation, etc. are taken from the XSD and stored in ADOC files. All generated ADOC files must be stored in the available “content” folder in the Gitlab repository “ASAM OTX Extensions” and simply included in “`index.adoc`”. In the rendered output, each extension shall begin at top heading level of the document section structure.

Generated ADOC content shall follow the rules of the Editorial Guide V1.1.0 (which also contains corresponding ADOC syntax examples).

Information about the system on which the solution is to be integrated:

- Target system: GitLab Community Edition v16.9.1
- Infrastructure: AWS EC2 - m4.xlarge
- Operating system: Ubuntu 20.04.2 LTS (Focal Fossa)
Debian-based distribution
- Docker image: docker-asciidoctor v1.81
- Runner: GitLab Runner 13.12.0
Runner type: Self-hosted
Executor: Docker
Architecture: Linux/amd64
- Container Runtime: Docker Engine 24.0.4
- Preferred and proven programming language: Python 3.8.10 (system-installed),

Python virtual environments supported via .venv

Python scripts can be executed within the available pipeline configuration.

2.7 User documentation

Operation of the generator shall be documented in a user manual. The documentation shall describe the following aspects:

- Structure of the template
- Procedure for generating the visualization
- Handling of the generator by working group members

Meaningful error messages for pipeline conversion problems (possibly with source code line number) and documentation of process workflow are also required.

3 Qualification requirements

In order to qualify for consideration as a potential provider of the services requested here, the bidder shall have

- proven experience in technical standardization projects and specification documentation,
- detailed knowledge about ASAM OTX Extensions,
- familiarity with ASAM CI pipelines,
- proficiency in AsciiDoc, and other markup or documentation toolchains,
- capability in producing clean, visually instructive documentation,
- fluency in technical American English, including understanding of domain-specific terminology.

4 Commercial and legal conditions

- ASAM office and service provider will jointly determine the need for attendance of the service provider in project group meetings.
- ASAM only accepts invoices that are submitted together with a declaration of acceptance, signed by Project Lead, ASAM management and the service provider.
- In case a deliverable is found to be defective or not up to customary industry quality standards, the service provider shall correct the deliverable free of charge. ASAM reserves the right not to pay for incomplete or defective deliverables.
- All newly created deliverables shall be compliant with the ASAM Editorial Guide
- If modifications to deliverables are required that constitute a deviation from the originally agreed statement of work (SoW), parties shall review and adjust the contract before the service provider starts the execution of the applicable tasks.
- All work results of the project (including all source code) shall be handed over to ASAM and shall become the exclusive property of ASAM. General terms & conditions of the service provider which are in conflict herewith will not be accepted.

- Contractors must ensure the availability of qualified personnel for the entire duration of the project.
- Offers should be **at fixed price**.
- Offers must be submitted in writing to ASAM within the above stated bidding period, including a clear description of the services provided and deliverables, terms & conditions, timeline and costs for the service
- Bidders for the project shall provide separate documents for the technical and commercial parts of their offer. Offers will be reviewed and evaluated on a technical basis by the projects requesting the services. The ASAM Office and the ASAM Technical Steering Committee will review the offers based on technical content and pricing.