# 2 References

## 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[2] ETSI ES 201 873-7: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 7: Using ASN.1 with TTCN-3".

[3] Recommendation ITU-T X.680: "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[4] Recommendation ITU-T X.694: "Information technology - ASN.1 encoding rules: Mapping W3C XML schema definitions into ASN.1".

[5] World Wide Web Consortium W3C Recommendation: "Extensible Markup Language (XML) 1.1".

NOTE: Available at <http://www.w3.org/TR/xml11>.

[6] World Wide Web Consortium W3C Recommendation (2006): "Namespaces in XML 1.0".

NOTE: Available at <http://www.w3.org/TR/REC-xml-names/>.

[7] World Wide Web Consortium W3C Recommendation (2004): "XML Schema Part 0: Primer".

NOTE: Available at <http://www.w3.org/TR/xmlschema-0>.

[8] World Wide Web Consortium W3C Recommendation (2004): "XML Schema Part 1: Structures".

NOTE: Available at <http://www.w3.org/TR/xmlschema-1>.

[9] World Wide Web Consortium W3C Recommendation (2004): "XML Schema Part 2: Datatypes".

NOTE: Available at <http://www.w3.org/TR/xmlschema-2>.

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] World Wide Web Consortium W3C Recommendation: "SOAP version 1.2, Part 1: Messaging Framework".

NOTE: Available at <http://www.w3.org/TR/soap12>.

[i.2] ISO 8601 (2004): "Data elements and interchange formats - Information interchange - Representation of dates and times".

[i.3] ETSI ES 202 781: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Configuration and Deployment Support".

[i.4] Void.

[i.5] Void.

[i.6] Void.

[i.7] Void.

[i.8] ETSI ES 202 789: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Extended TRI".

[i.9] ISO/IEC 10646 (2012): "Information technology - Universal Coded Character Set (UCS)".

[i.10] ISO/IEC 646: "Information technology - ISO 7-bit coded character set for information interchange".

[i.11] ETSI ES 202 782: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: TTCN-3 Performance and Real Time Testing".

[i.12] ETSI ES 202 784: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Advanced Parameterization".

[i.13] ETSI ES 202 785: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Behaviour Types".

[i.14] ETSI ES 202 786: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Support of interfaces with continuous signals".

[i.15] ETSI ES 201 873-7: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 7: Using ASN.1 with TTCN-3 ".

[i.16] ETSI ES 201 873-8: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 8: Using XML schema with TTCN-3".

[i.17] ETSI ES 201 873-11: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 11: Using JSON with TTCN-3".

# 4 Introduction

An increasing number of distributed applications use the XML format to exchange data for various purposes like data bases queries or updates or event telecommunications operations such as provisioning. All of these data exchanges follow very precise rules for data format description in the form of Document Type Description (DTD) [5] and [6] or more recently the proposed XML Schemas [7], [5] and [9]. There are even some XML based communication protocols like SOAP [i.1] that are based on XML Schemas. Like any other communication-based systems, components and protocols, XML based systems, components and protocols are candidates for testing using TTCN-3 [1]. Consequently, there is a need for establishing a mapping between XML data description techniques like DTD or Schemas to TTCN‑3 standard data types.

The core language of TTCN-3 is defined in ETSI ES 201 873-1 [1] and provides a full text-based syntax, static semantics and operational semantics as well as a definition for the use of the language with ASN.1 in ETSI ES 201 873‑7 [2]. The XML mapping provides a definition for the use of the core language with XML Schema structures and types, enabling integration of XML data with the language as shown in figure 1.



Figure 1: User's view of the core language and the various presentation formats

For compatibility reasons, it is the purpose of the present document that the TTCN-3 code obtained from the XML Schema using the explicit mapping will be the same as the TTCN-3 code obtained from first converting the XML Schema using Recommendation ITU‑T X.694 [4] into ASN.1 [3] and then converting the resulting ASN.1 code into TTCN-3 according to ETSI ES 201 873‑7 [2]. However, due to the specifics of testing, in a few cases the present document will produce a superset of what Recommendation ITU‑T X.694 [4] would produce. For example, according to Recommendation ITU‑T X.694 [4], abstract elements are omitted when converting the head element of a substitution group, while the present document includes also the abstract elements into the resulted **union** type, thus allowing provoking the SUT with incorrect data.