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**Information technology — Open
Document Architecture (ODA) and
interchange format: Abstract interface for
the manipulation of ODA documents**

*Technologies de l'information — Architecture des documents ouverts
(ODA) et format d'échange: Interface abstraite pour la manipulation des
documents d'ODA*



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Contents

	<i>Page</i>
Foreword	iv
1 Scope	1
2 Normative references	1
2.1 Identical Recommendations International Standards	2
2.2 Paired Recommendations International Standards equivalent in technical content	2
2.3 Additional references	2
3 Definitions	3
4 Abbreviations	3
5 Conventions	3
6 Purpose	3
6.1 Concept of the Abstract Interface	3
6.2 Relationship to functional profiles	4
6.3 Identification	4
6.4 Consistent handling of ODA documents	4
6.5 Relationship between operations	4
6.6 Grouping of operations	5
6.7 Relationship to communication aspects	5
7 Operations on ODA documents	5
7.1 Document level operations	6
7.1.1 List	6
7.1.2 Open	7
7.1.3 Close	7
7.2 Read only operations	8
7.2.1 Get	8
7.2.2 Search	8
7.3 Altering operations	9
7.3.1 Create	9
7.3.2 Delete	10
7.3.3 Modify	10
7.3.4 Replace	11
7.3.5 Copy	11
7.3.6 Move	12
7.4 Reservation operations	13
7.4.1 Reserve	13
7.4.2 Unreserve	13
7.5 ODA-independent operations	14
7.5.1 BeginGroup	14
7.5.2 EndGroup	14

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8	ASN.1 specification of the abstract operations	14
	Annex A – Alignment with DTAM document Manipulation abstract service	18
	A.1 Introduction.....	18
	A.2 Description of the mapping to DTAM-DM abstract service.....	18
	Annex B – Alignment with DOAM set of operations	20

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 8613-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 18, *Document processing and related communication*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation T.413.

ISO/IEC 8613 consists of the following parts, under the general title *Information technology — Open Document Architecture (ODA) and interchange format*:

- *Part 1: Introduction and general principles*
- *Part 2: Document structures*
- *Part 3: Abstract interface for the manipulation of ODA documents*
- *Part 4: Document profile*
- *Part 5: Open Document Interchange Format*
- *Part 6: Character content architectures*
- *Part 7: Raster graphics content architectures*
- *Part 8: Geometric graphics content architectures*
- *Part 9: Audio content architectures*
- *Part 10: Formal specifications*
- *Part 11: Tabular structures and tabular layout*
- *Part 12: Identification of document fragments*
- *Part 13: Spreadsheet*
- *Part 14: Temporal relationships and non-linear structures*

Annex A forms an integral part of this part of ISO/IEC 8613. Annex B is for information only.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY –
OPEN DOCUMENT ARCHITECTURE (ODA) AND INTERCHANGE FORMAT:
ABSTRACT INTERFACE FOR THE MANIPULATION OF ODA DOCUMENTS**

1 Scope

The purpose of ITU-T Rec. T.410-Series | ISO/IEC 8613 is to facilitate the interchange and manipulation of documents.

In the context of these Recommendations | International Standards, documents are considered to be items such as memoranda, letters, invoices, forms and reports, which may include pictures and tabular material. The content elements used within the documents may include graphic characters, raster graphics elements and geometric graphics element, all potentially within one document.

NOTE – These Recommendations | International Standards are designed to allow for extensions, including spreadsheets and additional types of content such as video.

In addition to the content types defined in these Recommendations | International Standards, ODA also provides for arbitrary content types to be included in documents.

These Recommendations | International Standards apply to the interchange of documents by means of data communications or the exchange of storage media.

These Recommendations | International Standards provide for the interchange of documents for either or both of the following purposes:

- to allow presentation as intended by the originator;
- to allow processing, such as editing and reformatting.

The composition of a document in interchange can take several forms:

- formatted form, allowing presentation of the document;
- processable form, allowing processing of the document;
- formatted processable form, allowing both presentation and processing of the document.

These Recommendations | International Standards also provide for the interchange of ODA information structures used for the processing of interchanged documents.

This Recommendation | International Standard:

- describes an Abstract Interface that supports manipulation of ODA documents;
- defines the operations that are applicable to document fragments in order to facilitate the handling of ODA documents, and to support applications.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T/CCITT Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation T.411 (1993) | ISO/IEC 8613-1:1994, *Information technology – Open Document Architecture (ODA) and interchange format: Introduction and general principles.*
- ITU-T Recommendation T.412 (1993) | ISO/IEC 8613-2:1995, *Information technology – Open Document Architecture (ODA) and interchange format: Document structures.*
- ITU-T Recommendation T.414 (1993) | ISO/IEC 8613-4:1994, *Information technology – Open Document Architecture (ODA) and interchange format: Document profile.*
- ITU-T Recommendation T.415 (1993) | ISO/IEC 8613-5:1994, *Information technology – Open Document Architecture (ODA) and interchange format: Open document interchange format.*
- ITU-T Recommendation T.416 (1993) | ISO/IEC 8613-6:1994, *Information technology – Open Document Architecture (ODA) and interchange format: Character content architectures.*
- ITU-T Recommendation T.417 (1993) | ISO/IEC 8613-7:1994, *Information technology – Open Document Architecture (ODA) and interchange format: Raster graphics content architectures.*
- ITU-T Recommendation T.418 (1993) | ISO/IEC 8613-8:1994, *Information technology – Open Document Architecture (ODA) and interchange format: Geometric graphics content architectures.*
- ITU-T Recommendation T.419¹⁾ | ISO/IEC 8613-9: ...¹⁾, *Information technology – Open Document Architecture (ODA) and interchange format: Audio content architectures.*
- ITU-T Recommendation T.421 (1994) | ISO/IEC 8613-11:1995, *Information technology – Open Document Architecture (ODA) and interchange format: Tabular structures and tabular layout.*
- ITU-T Recommendation T.422¹⁾ | ISO/IEC 8613-12: ...¹⁾, *Information technology – Open Document Architecture (ODA) and interchange format: Identification of document fragments.*
- ITU-T Recommendation T.424¹⁾ | ISO/IEC 8613-14: ...¹⁾, *Information technology – Open Document Architecture (ODA) and interchange format: Temporal relationships and non-linear structures.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1).*
ISO/IEC 8824:1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1).*
- CCITT X.400-Series Recommendations (1988), *Message Handling System.*
ISO/IEC 10021:1990, *Information technology – Text communication – Message Oriented Text Interchange Systems (MOTIS).*

2.3 Additional references

- CCITT Recommendation T.431 (1991), *Document Transfer and Manipulation (DTAM) – Services and protocols - Introduction and general principles.*
- CCITT Recommendation T.432 (1991), *Document Transfer and Manipulation (DTAM) – Services and protocols - Service definition.*
- CCITT Recommendation T.433 (1991), *Document Transfer and Manipulation (DTAM) – Services and protocols - Protocol specification.*
- ITU-T Recommendation T.435 (1995), *Document Transfer and Manipulation (DTAM) – Services and protocols – Abstract service definition and procedures for confirmed document manipulation.*
- ITU-T Recommendation T.436 (1995), *Document Transfer and Manipulation (DTAM) – Services and protocols – Protocol specifications for confirmed document manipulation.*
- ISO/IEC 8613-10:1991, *Information processing – Text and office systems – Office Document Architecture (ODA) and interchange format – Part 10: Formal specifications.*
- ISO/IEC 10031-1:1991, *Information technology – Text and office systems – Distributed-office-applications model – Part 1: General model.*
- ISO/IEC 10166-1 (1991), *Information technology – Text and office systems – Document Filing and Retrieval (DFR) – Part 1: Abstract service definition and procedures.*

¹⁾ Presently at the stage of draft.

3 Definitions

For the purposes of this Recommendation | International Standard, the definitions given in ITU-T Rec. T.411 | ISO/IEC 8613-1 and ITU-T Rec. T.422 | ISO/IEC 8613-12 apply.

The following additional definitions are used within this Recommendation | International Standard:

- 3.1 basic operation:** An operation that could not consist of a sequence of other operations without a clear loss of efficiency.
- 3.2 compound operation:** An operation that could be substituted by a sequence of other operations.
- 3.3 document identifier:** An identification of an ODA document that may be permanent (the “document reference” document profile attribute) or not (an integer value).
- 3.4 query:** A logical expression comprising logical operators that connect values of attributes.

4 Abbreviations

For the purposes of this Recommendation | International Standard, the abbreviations given in ITU-T Rec. T.411 | ISO/IEC 8613-1 apply.

The following additional abbreviations are used within this Recommendation | International Standard:

AGCS	Audio Graphics Conferencing Service
AVIS	Audio Visual Interactive Service
CDH	Cooperative Document Handling
DAP	Document Application Profile
DFR	Document Filing and Retrieval
DOAM	Distributed Office Applications Model
DTAM	Document Transfer And Manipulation
DTAM-DM	Document Transfer And Manipulation - Document Manipulation
ROSE	Remote Operations Service Element

5 Conventions

For the purposes of this Recommendation | International Standard, the conventions given in ITU-T Rec. T.411 | ISO/IEC 8613-1 and ITU-T Rec. T.412 | ISO/IEC 8613-2 apply.

6 Purpose

6.1 Concept of the Abstract Interface

Documents may be edited, formatted, imaged, manipulated, and stored locally or in an open environment. The Abstract Interface applies to those aspects of manipulation that may be defined in an open environment. Nevertheless, it may be up to a specific implementation to provide interfaces in a compatible way for the open and the local environments.

Although the Abstract Interface defines functions to handle ODA documents, it does not preclude any definition of any specific application, but the applications themselves are responsible for the proper use of the operations provided by the Abstract Interface.

The objectives of the Abstract Interface are summarized in the following list of functions:

- Ensure consistency of manipulated ODA documents.
- Facilitate distributed processing of ODA documents. The Abstract Interface hides distribution details. Furthermore, local integration of products from different vendors can be achieved by using the Abstract Interface.

- Enable the defined operations to be mapped onto existing services, such as Document Transfer And Manipulation (DTAM).
- Facilitate the integration of a variety of applications that manipulate ODA documents. The applications can be designed and interfaced at a higher level of abstraction.
- Present the user a simple conceptual model of a complex ODA document.

The operations that are defined in the Abstract Interface are specified on a general level to support document manipulation in the context of various types of applications, such as:

- Reading and manipulation of fragments of a document.
- Simple conferencing, where two or more users possess identical copies of a document and are exchanging updates on document fragments in terms of operations.
- Audio Graphics Conferencing Service (AGCS).
- Remote editing, where one or more users have a complete or partial view of a document. The document is read and updated by exchanging operations.
- Cooperative Document Handling (CDH), where several partners handle ODA documents in a distributed environment.
- Videotex Interworking, for compatibility with ITU-T applications.
- AudioVisual Interactive Service (AVIS).
- ODA document processing applications development, including word processors and desktop publishing systems.
- Asynchronous distributed document handling.

6.2 Relationship to functional profiles

For document manipulation, specific functional profiles or amendments to existing ones may be defined to specify:

- which operations may be used;
- which operations may be applied to which type of constituents;
- which sets of constituents shall be carried together by one operation;
- which rules have to be followed to guarantee consistency of the document;
- how the grouping of operations shall be used;
- how the reserving of constituents of a document shall be realized.

6.3 Identification

In the Abstract Interface for the manipulation of ODA documents, the mechanism for identifying document fragments, to be used as arguments to the manipulation operations, is based on the use of location expressions, according to ITU-T Rec. T.422 | ISO/IEC 8613-12.

6.4 Consistent handling of ODA documents

It is a basic requirement of the manipulation of ODA documents that consistency of the documents being manipulated is guaranteed. After successful manipulation and closing of a document, it shall be a conformant ODA document and it shall conform to the Document Application Profile (DAP) specified in the document profile, if any.

The Abstract Interface defines some general rules to describe the effect that the different operations have on the documents. The implementations of the Abstract Interface shall guarantee the consistency of the documents. To help in this task, BeginGroup and EndGroup operations are provided, that could be used to indicate that the manipulated document has to be updated in order to achieve the required consistency.

6.5 Relationship between operations

The List operation applies to the document store, and it is used to select one or more documents for further manipulation.

The Open operation identifies a document which is to be handled. Several documents may be opened at the same time (e.g. for copying a document fragment from one document to another). There is a Close operation to complement the Open operation.

Before issuing any read only, altering, or reservation operation (see clause 7), the Open operation shall be issued. The Open operation also allows to create a completely new document.

A Reserve operation (and a complementary Unreserve operation) is provided to handle the possible concurrent manipulation of a document fragment. If a document fragment is manipulated without a previous use of the Reserve operation, the result may be unpredictable if other users have access to that document fragment.

Read only and altering operations may be issued without any particular order restriction, apart from those given in this subclause.

The use of all the operations is explained in the corresponding subclauses of clause 7.

6.6 Grouping of operations

A mechanism for grouping a sequence of operations is provided by the Abstract Interface.

The application shall be responsible for the correct use of this feature and shall define the meaning of the grouping of operations.

The main objective of this mechanism is to group operations with some meaning for the application that is using the Abstract Interface, in order to:

- avoid communications overhead;
- ease the handling of consistency, including the provision of recovery procedures applied to a group of operations.

This mechanism is provided by BeginGroup and EndGroup operations (see 7.5.1 and 7.5.2), that allow grouping to be performed during operations invocation.

6.7 Relationship to communication aspects

The Abstract Interface is independent of the communication mechanism. However, it is aligned with the communication support for access and manipulation provided by DTAM, as explained in Annex A.

In the context of interactive handling, three aspects are distinguished:

- the access to an ODA document;
- the inner manipulation of an accessed ODA document;
- the communication environment supporting access and manipulation.

In the case that the Abstract Interface is used by communication applications, specific communication application profiles, or functional profiles, may be specified to:

- transfer manipulations of ODA documents in an appropriate way;
- negotiate the application environment;
- negotiate the capabilities of the user system.

NOTE – Rules for specifying communication application profiles are defined, for example, in CCITT Recommendation T.431.

7 Operations on ODA documents

This clause specifies the operations that constitute the Abstract Interface to support the manipulation of documents.

The operations are specified as abstract operations in terms of:

- argument(s);
- result(s);
- error(s).

Operations are applied to the constituents of the document architecture.