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STANDARD

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**8613-3**

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

*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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## 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* [ISO/IEC 8613-3:1995](https://standards.iso.org/standards/catalog/standards/sist/1b58f46a-fa22-48cf-ab9d-4bb66e0bcb74/iso-iec-8613-3-1995)
- *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.419<sup>1)</sup> | ISO/IEC 8613-9: ...<sup>1)</sup>, *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.422<sup>1)</sup> | ISO/IEC 8613-12: ...<sup>1)</sup>, *Information technology – Open Document Architecture (ODA) and interchange format: Identification of document fragments.*
- ITU-T Recommendation T.424<sup>1)</sup> | ISO/IEC 8613-14: ...<sup>1)</sup>, *Information technology – Open Document Architecture (ODA) and interchange format: Temporal relationships and non-linear structures.*

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## 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.*

<sup>1)</sup> 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.

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## 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.

Five kinds of operations are distinguished by the Abstract Interface:

- document level operations;
- read only operations;
- altering operations;
- reservation operations;
- ODA-independent operations.

Furthermore, operations are classified as:

- *basic operations*;
- *compound operations*.

Compound operations can be performed as a sequence of basic operations.

The operations defined by the Abstract Interface are aligned with those defined in ISO/IEC 10031-1 Distributed Office Applications Model (DOAM), as explained in Annex B.

Some errors are defined that apply to several operations. These are:

- *Error in the constituents* – The constituent or constituents of the argument are not valid.
- *Invalid location expression or document* – The document or the location expression used as arguments are invalid.
- *Location expression does not match* – The location expression of the argument does not match.
- *Document fragments reserved (source region reserved, target region reserved)* – The location expression of the argument contains reserved constituents. For some operations which work with two documents, this error is referred to as “source region reserved” (for the origin document) and “target region reserved” (for the destination document).
- *Invalid document identifier* – The document identifier of the argument is not valid.
- *Document does not exist* – The document that is intended to be opened or closed does not exist.
- *Improper access rights* – The requestor of the operation does not have the necessary access rights to perform the operation.
- *Document is not open* – A manipulation operation is requested onto a document that has not been previously open using the Open operation.
- *Unspecified error* – An error has occurred that is not specified.

## 7.1 Document level operations

### 7.1.1 List

The List abstract operation obtains a list of ODA documents, matching particular criteria, in a document store. This operation is independent of the structure of the store. If the store has a standard structure, like, for example, that specified in ISO/IEC 10166 Document Filing and Retrieval (DFR), selection of documents may be achieved using DFR operations.

The selection criteria are expressed in a *query* that consists of a logical expression comprising ‘not’, ‘and’ and ‘or’ logical operators that connect values of document profile management attributes. In this way, for example, documents with specific values in one or more attributes can be selected.

If the “query” argument is not provided, then all documents from the store are listed.

(Identifiers of) complete documents are selected with the List operation. For selecting (identifiers of) document constituents the Search operation (see 7.2.2) shall be used.

Possible errors specific for this operation are:

- *Invalid query* – The query of the argument is not valid.
- *Query does not match* – The query of the argument does not match with any document.

This is a basic operation.

*Argument:* query. (optional)

*Result:* sequence of document identifiers.

*Errors:* invalid query;  
query does not match;  
improper access rights;  
unspecified error.

### 7.1.2 Open

The Open abstract operation selects a particular document in order to make further manipulations on fragments of it. The document identifier used as the argument may be obtained from a previous use of the List operation.

Several documents may be maintained open at the same time. This shall be achieved by issuing several Open operations before closing all open documents.

An Open operation is always necessary before inner manipulation of a document.

A complete document is selected with the Open operation. The Reserve operation (see 7.4.1) is used to select and reserve a fragment of a document already open.

The “document identifier” argument shall be a permanent identifier (the “document reference” attribute of the document profile). The “mode” optional argument may have three values: ‘read’, ‘modify’ and ‘create’. If a document is open with “mode” equal to ‘read’, it will only be possible to perform read operations on it. In case it is open with “mode” equal to ‘modify’, it will be possible to apply all manipulation operations. Finally, with the ‘create’ value, it means that the document is to be created. In this latter case, the permanent identifier is the identification to be given to the document.

The “document identifier” is a non-permanent (temporary) identifier of the document (as an integer value) that is provided when opening a document.

A possible error specific for this operation is:

- *Document already open* – This error is used when there is an attempt to open an already open document.

This is a basic operation. <https://standards.iteh.ai/catalog/standards/sist/1b58f46a-fa22-48cf-ab9d-4bb66e0bcb74/iso-iec-8613-3-1995>

*Arguments:* document identifier; (permanent identifier)  
mode. (optional)

*Result:* document identifier. (non-permanent identifier)

*Errors:* invalid document identifier;  
document does not exist;  
improper access rights;  
document already open;  
unspecified error.

### 7.1.3 Close

The Close abstract operation is used to finish the manipulation process of a document. The document identifier used as the argument has to correspond to an already open document. No argument is needed if only one document is open.

When the application wants to close a document, the document could be inconsistent if altering operations (see 7.3) have been applied to the document. In this case, and to avoid closing a non-conformant document, the document is implicitly updated.

Furthermore, when closing a document, all reserved document fragments are implicitly unreserved (see 7.4.1 and 7.4.2).

The “document identifier” result is the permanent identifier of the document (the “document reference” attribute of the document profile), that is provided when closing the document.

Possible errors specific for this operation are:

- *Document impossible to update* – There is a problem in the document to be closed that makes the document impossible to update.
- *Groups not yet ended* – Some BeginGroup operations still need EndGroup operations to be issued.