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TECHNICAL SPECIFICATION

Multimedia systems and equipment – Multimedia e-publishing and e-book – Conceptual model for multimedia e-publishing

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MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA E-PUBLISHING AND E-BOOK – CONCEPTUAL MODEL FOR MULTIMEDIA E-PUBLISHING

FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62229, which is a technical specification, has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 2006. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Annexes D and E have been added;

b) Clause 5.6 has been added.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
100/2818/DTS	100/2870/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

Enlarging the size of the international and domestic markets for multimedia e-publishing and e-books requires standardization of their related technology. As a first step to the discussion and standardization of the technology, a conceptual model for the technology should be established and standardization issues should be clarified. The conceptual model includes all the e-publishing components and their functionality and clarifies the relationships between them. These clarifications are essential for the development of standards for e-publishing and e-book technology and are required by associated industries and users.

MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA E-PUBLISHING AND E-BOOK – CONCEPTUAL MODEL FOR MULTIMEDIA E-PUBLISHING

1 Scope

This document describes a conceptual model for multimedia e-publishing and e-book. The conceptual model is specified from the standardization point of view in order to clarify the functionality of e-publishing/e-book components and the relationships between them and to define e-publishing services.

The model provides the key technology to be standardized in the e-publishing environment. The modelling is not intended for actual implementation of a system or system components for e-publishing. The modelling is expected to be used as a reference for discussing and developing new standardization work on multimedia e-publishing and e-books and, therefore, to contribute to the expansion of the international and domestic markets for multimedia e-publishing and e-book.

The model is given as an example of the models for the multimedia data creation, data structure, equipment/system structure and user-system interface defined in IEC 61998.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61998:2015, *Model and framework for standardization in multimedia equipment and systems*

ISO/IEC 19757-2:2008, *Information technology – Document Schema Definition Language (DSDL) – Part 2: Regular-grammar-based validation – RELAX NG*

Extensible Markup Language (XML) 1.0 (Third Edition), W3C Rec., 2004-02-04

NOTE Extensible Markup Language (XML) is a subset of ISO 8879:1986 (SGML) amended by its Technical Corrigendum 2.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
multimedia e-publishing
business model that produces, distributes and/or deals in multimedia e-books

3.2
multimedia e-book
multimedia content consisting of texts, graphics, sounds and/or videos

3.3
data preparer
organization or person that prepares an e-book

Note 1 to entry An editor is an example of a preparer. See ISO 9660:1988.

3.4
publisher
organization or person that issues and distributes an e-book

3.5
reading device
equipment on which e-books are rendered and presented

4 Model for multimedia e-publishing

4.1 Contents creation/distribution model

Contents for e-publishing are created and distributed according to the process shown in Figure 1.

Author <--(1)--> **Data preparer** <--(2)--> **Publisher** --(3)--> **Reader**

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Key

(1) Content data in submission format

(2) Content data in generic format

(3) Content data in reader's format

Figure 1 – Contents creation/distribution process

Between the adjacent steps of the process, e-book content data are interchanged using the following formats.

a) Submission format

Submission formats depend on the functionality and capability of authors' equipment or data preparer. Standardization of the formats is required, in particular, by data preparers.

An important functionality of the submission format is a support for proofreading mark-up to be interchanged between the author and the data preparer.

b) Generic format

Standardization of generic formats is essential for interchanging e-book content data between the data preparer and the publisher. Some specifications for generic formats should be discussed and accepted as international standards.

A support for proofreading is (or may be) also required for the generic format.

c) Reader's format

Reader's formats depend on the functionality and capability of readers' equipment, such as PDA, PC, mobile phone or e-book specific equipment. Standardization for the formats will be required, in particular, for the readers' benefit.

4.2 Multimedia data structure model

Multimedia e-book content data in the formats given in 4.1 should have the following structures.

a) Content data in submission format

Content data in submission format should have logical structures, based on the authors' intention or the template of the data preparer, for flexible editing and revising. Multimedia content data include character strings, pictures, tables and other types of contents. Document style specifications or information are not always required.

b) Content data in generic format

Content data in generic format should have logical structures (the structures should be described by ISO/IEC 19757-2 and/or XML (W3C Rec.)) and document style specifications (for example, DSSSL (ISO/IEC 10179) or XSL specification) for human readable rendering. Publishers shall convert the generic format into a reader's format for e-book distribution. Style specifications for the content data may be separate standards from the standards for the logical structure of generic formats.

NOTE BBeB Book XML Xylog File Format and oebps1.2(OeBF) are examples of generic formats.

c) Content data in reader's format

Content data in reader's format should (or may) have the following features:

– preserving visible image;

– non-revisable (final form);

– lightweight.

A reader's format may have a specific data structure depending on the reading device. When rendering functionality is supported by reading devices, both logical structure and style specification are recommended for flexibility of presentation. When no rendering functionality is supported by reading devices, the reader's format should have a final form structure.

NOTE BBeB Book File Format and PDF are examples of readers' formats.

d) Proofreading format

Proofreading formats should have the following features:

– object location;

– operation (delete, add, etc.);

– new contents.

Proofreading formats are imported into a submission format or generic format. Proofreading formats in a generic format are requested to support style objects.

4.3 E-book distribution model

4.3.1 General

An e-publishing system consists of the components shown in Figure 2. These components deal with their corresponding information.

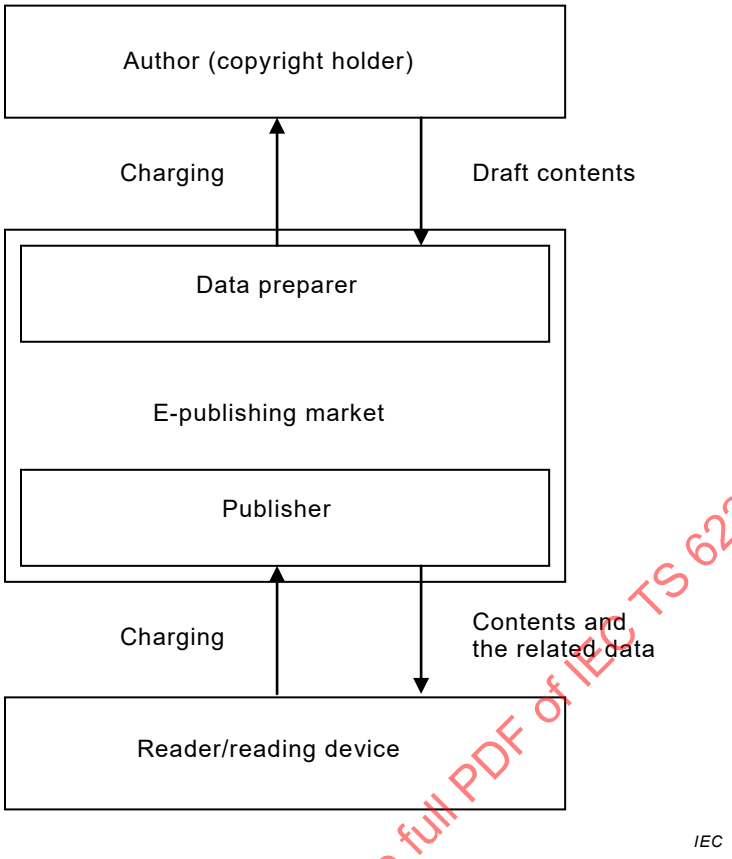

Figure 2 – E-book distribution model

4.3.2 E-publishing market

The e-publishing market is an environment for the distribution of multimedia e-book contents and the related data among data preparers, publishers and readers. This data distribution can be supported by an appropriate charging mechanism in accordance with the related data.

E-publishing activities will increase PIM (personal information management) data storage within the market. The PIM data can encourage an appropriate e-book distribution.

4.3.3 Related data

Related data includes:

– meta data;
– copyright data;
– DRM (digital rights management) data;
– PIM (personal information management) data;
– etc.

4.4 Interfaces to e-book systems and equipment

4.4.1 General

E-book systems and equipment should have appropriate user-system interfaces and/or application program interfaces (APIs) providing their services to data preparers, publishers and e-book readers.

4.4.2 Operation and presentation

Readers operate their reading devices and review their e-books with the appropriate multimedia presentations.

4.4.3 E-paper

An e-paper is a paper-like electronic display device, which could provide a sophisticated user-system interface for e-book presentation. For appropriate application, the properties of e-paper, for example, display size, resolution, refresh rate, contrast, and colour, should be discussed.

4.4.4 Application program interface

The application program may access multimedia e-book contents via application program interfaces.

5 Issues to be standardized

5.1 Data formats of multimedia e-book contents

a) Submission format

In addition to logical structure description for authoring, some versioning functionality and proofreading support will be required.

b) Generic format

Logical structure description and style specification formats shall be standardized as a generic format for multimedia e-publishing/e-books.

In the actual e-publishing environment, DRM data and other security features will be included in e-book contents. From the point of view of standardization, however, they should be specified as separate standards, since they can be applied to other media as well.

c) Reader's format

Some non-revisable formats should be specified in accordance with the presentation functionality of reading devices.

5.2 Minimum requirements for multimedia e-book viewers

Multimedia e-book viewers should support, for example, the following functionalities:

- page forward and backward;
- magnification;
- reduction;
- page jump;
- bookmark;
- hyper-linking.

Multimedia e-book viewers should support other functionalities for confirming readability and providing user preferences:

- screen layout factors;
- horizontal/vertical composition;
- font size/family;
- etc.

NOTE For this discussion, see ISO/IEC 24754-1.

5.3 User interfaces for multimedia e-book viewers

To avoid user confusion, the guidelines of some user interfaces for multimedia e-book viewers should be standardized.

5.4 E-publishing services

E-book data can be accessed by some application programs. For portability of application, APIs (application program interfaces) should be standardized.

5.5 Guideline for e-book distribution by interchangeable storage media

E-book distribution by interchangeable storage media such as CD-ROM or DVD-ROM will bend and cause permanent distortion of the media, which makes the media unreadable. Some guidelines for dealing with the media should be published, specifying some restriction of media packaging and delivery.

5.6 Application specific e-books

Electronic dictionary, electronic map, electronic newspaper, digital comic and digital sheet music are application-specific e-books. Issues to be standardized for those e-books are discussed in Annexes A, B, C, D and E respectively.

Annex A
(informative)

Electronic dictionary

Electronic dictionaries are classified by an allocation of dictionary data into:

a) web dictionary: dictionary data are allocated on a web server and referred to on request;

b) PC dictionary: dictionary data are provided by an interchangeable storage media such as CD-ROM, DVD, etc. and installed within a PC (or a PDA);

c) stand-alone dictionary: dictionary data are allocated on stand-alone portable equipment; additional dictionary data may be attached, for example, via a storage card.

Those dictionaries consist of:

– dictionary data;

– retrieving software;

– viewing software.

Standardization of electronic dictionaries is required for the following items:

a) Interchange format of dictionary data: standardization is indispensable for a web dictionary and a PC dictionary. For a stand-alone dictionary, it is recommended that additional dictionary data be standardized in their format considering the requirement for a lightweight feature of the format.

b) User interfaces of viewing software and some functions of retrieving software: it is recommended that some guidelines for user interfaces and functions be given in order to avoid confusion for the dictionary user.

c) API (application program interface) of retrieving software: a web dictionary and a PC dictionary can be accessed by an application program via the appropriate API. It is recommended that the API be standardized from the point of view of application portability.

Annex B
(informative)

Electronic map and its application in e-book

Electronic map (e-map) objects can be described by GML (Geography Mark-up Language) and related standards.

SVG (Scalable Vector Graphics) can support a flexible map presentation. These map description languages provide a structured core e-map.

E-maps can actually be used in location-based services (LBS) supported by the technology of GPS (Global Positioning System) and/or GIS (Geographic Information Systems). In these applications, some interactive operation could be essential. The relationship between e-map application and core e-map are shown in Figure B.1.

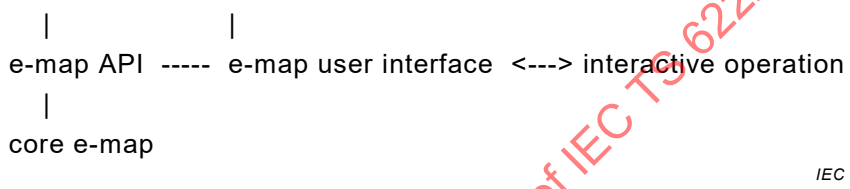

Figure B.1 – Electronic map application in an e-book

Core e-maps described by GML or SVG (and their fragments) can be imported into the generic format of an e-book by using an appropriate definition of the name space. They configure an e-map application in e-book. The following technologies are the subject of standardization of e-map application in e-books:

a) E-map API;

b) E-map user interface.

Annex C
(informative)

Electronic newspaper

IPTC (International Press Telecommunications Council) has published NewsML that can describe all the news objects required for interchanging electronic newspaper data. These newspaper data (including some fragments of NewsML data) can be imported into the generic format of an e-book by using appropriate definitions of name spaces. Description of NewsML using RELAX NG (ISO/IEC 19757-2) will contribute to the easy importing of news data into e-books.

Some harmonization of specifying document styles/layouts for news data and ordinary e-book data are the subject of further study.

Annex D
(informative)

Digital comic

D.1 Generic format

In order to create a digital comic efficiently, digital comic data should be structured by multiple layers. Those data are interchanged between data preparers and publishers. Therefore, they should be standardized as a generic format of comic data.

The layer structure should include the following layers and layer-to-layer relationships. Comic data within a layer can be edited independently from data in other layers:

a) frame layer: comic frames in a page are defined and edited;

b) line drawing layer: comic lines are drawn using a specified digital pen and brush;

c) tone layer: tone areas and the tones are specified;

d) solid colouring layer: solid colouring is specified on a closed area;

e) effect layer: comic-specific effects (sound effect, effect lettering, etc.) are described;

f) balloon layer: balloons and texts within balloons are specified including fonts and text layouts.

D.2 Reader's format and other formats

Digital comics are represented on a variety of equipment. It is required to show a guideline of recommended resolution employed in the formats of original pictures, editing/authoring data and the reader's representation.