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Multimedia e-publishing and e-book –
Conceptual model for multimedia e-publishing**

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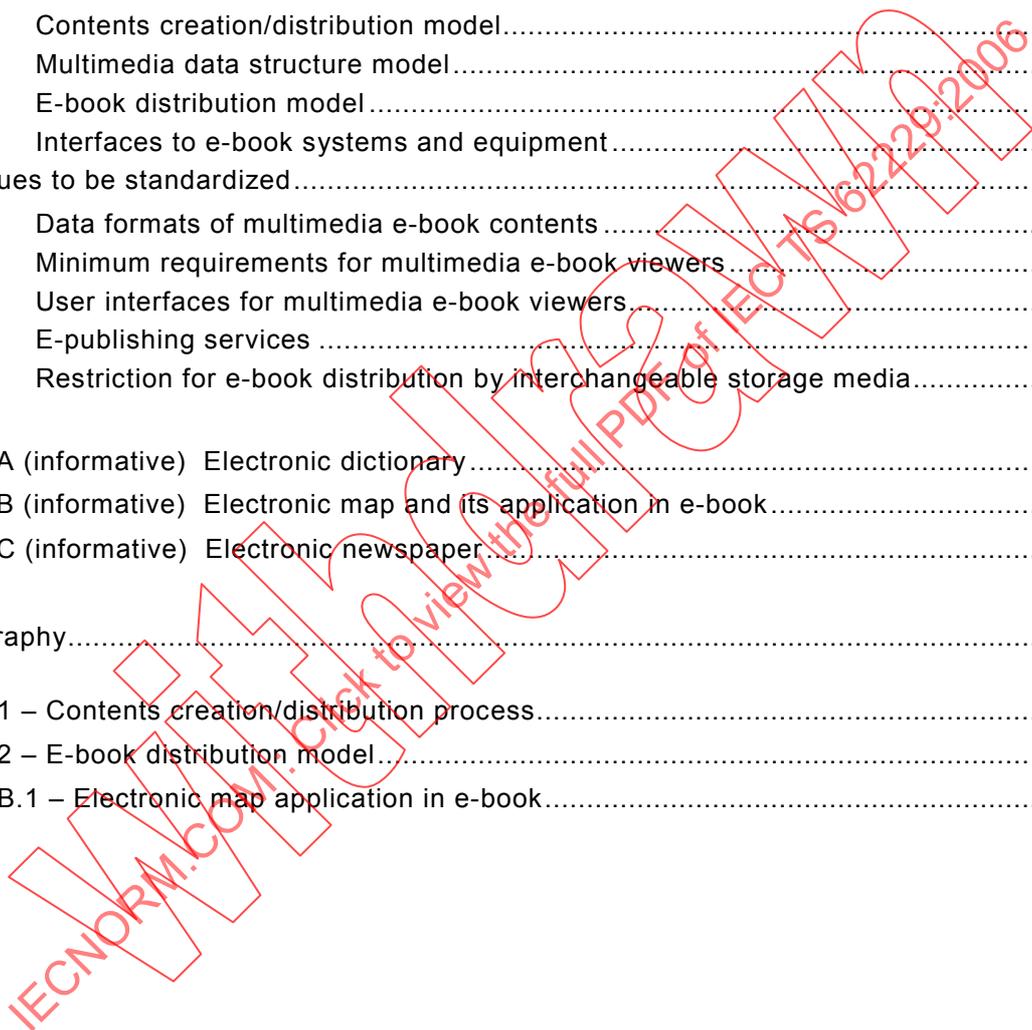Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION
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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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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.

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

Enquiry draft	Report on voting
100/1042/DTS	100/1088/RVC

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 publication 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 maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- 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- withdrawn;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 Technical Specification 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 e-publishing environment. It should be noted that 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 61998:1998.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions 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 61998:1999, *Model and framework for standardization in multimedia equipment and systems*

ISO/IEC 10179:1996 *Information technology − Processing languages − Document Style Semantics and Specification Language (DSSSL)*

ISO/IEC 19757-2:2003 *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.

3.1
multimedia e-publishing
business model which 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   An editor is an example of a preparer. See ISO 9660:1988, *Information processing – Volume and file structure of CD-ROM for information interchange*

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 (for example, described by XML (W3C Rec.) or SGML (ISO 8879 and its Cor. 2)) 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

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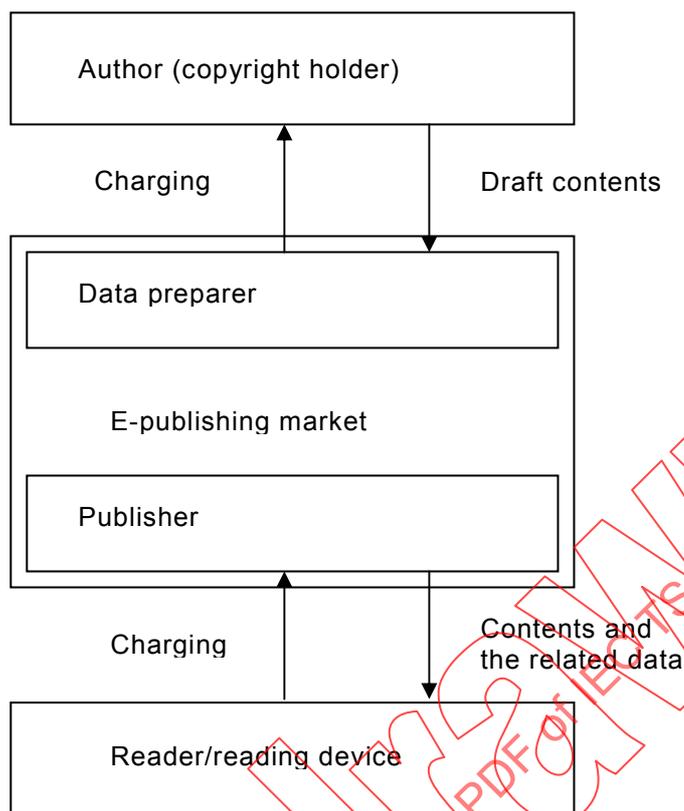
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Figure 2 – E-book distribution model

4.3.1   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.

4.3.2   Related data

Related data include

– meta data;

– copyright data;

– DRM (digital rights management) data;

– PIM (personal information management) data;

– etc.

4.4 Interfaces to e-book systems and equipment

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.

4.4.1   Operation and presentation

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

4.4.2   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, colour, etc., should be discussed.

4.4.3   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;
- magnify;
- reduction;
- page jump;
- bookmark;
- hyper-linking.

Multimedia e-book viewers should support other functionalities for confirming readablity and providing user preference:

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

NOTE   For this discussion, see ISO/IEC 24754: *Minimum requirements for specifying document rendering systems* (under consideration).

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.

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.