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Software ergonomics for multimedia user interfaces —

Part 2: Multimedia navigation and control

Ergonomie des logiciels pour les interfaces utilisateur multimédias —

Partie 2: Navigation et contrôle multimédias

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14915-2 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction*.

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ISO 14915 consists of the following parts, under the general title *Software ergonomics for multimedia user interfaces*:

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— *Part 1: Design principles and framework*

— *Part 2: Multimedia navigation and control*

— *Part 3: Media selection and combination*

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Introduction

This part of ISO 14915 applies to both the presentation of content and interaction techniques for user control of computer-based multimedia applications in general, including stand-alone and networked-delivered applications. These applications can vary in size and complexity (e.g. a single web page, a catalogue or an interactive simulation).

This part of ISO 14915 provides specific guidance related to multimedia navigation and control that relates to the three aspects inherent in designing multimedia user interfaces identified in ISO 14915-1:

— content design;

— interaction design;

— media design.

Content design is based on the cognitive needs of the various different users and the different tasks involved in an application. Content design also takes into account various approaches to organize the content to provide support for different methods of exploring the content.

Interaction design focuses on the presentation of this content to users and the methods that will be provided to users for them to interact with this content.

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Media design focuses on making use of particular media objects to implement the content and interaction designs.

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This part of ISO 14915 is concerned with the navigation between, and control of, various media objects, presentation segments, and content chunks. Specific guidance on media design is provided in ISO 14915-3.

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Software ergonomics for multimedia user interfaces —

Part 2:
Multimedia navigation and control

1 Scope

This part of ISO 14915 provides recommendations and requirements for the design of multimedia user interfaces with respect to the following aspects: design of the organization of the content, navigation and media-control issues. This part of ISO 14915 is limited to the design of the organization of the content and does not deal with the design of the content in general. Design issues within a single medium (e.g. the lighting of a film sequence) are only addressed with respect to the ergonomic issues related to user controls.

This part of ISO 14915 provides

— a framework for the structuring of multimedia applications,

— information and recommendations on the design of navigation structures and navigation mechanisms for use within multimedia applications, and

— information and recommendations on the design of controls for use within multimedia applications.

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It does not specifically address entertainment applications, although some recommendations can also be applicable to that domain.

ISO 14915 does not address implementation issues. The ergonomic requirements can be realised through very different mechanisms, e.g. the delivery system, a scripting language or the application.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 9241-12:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 12: Presentation of information*

ISO 9241-13, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 13: User guidance*

ISO 9241-16:1999, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 16: Direct manipulation dialogues*

ISO 14915-1, *Software ergonomics for multimedia user interfaces — Part 1: Design principles and framework*

ISO/TS 16071, *Ergonomics of human-system interaction — Guidance on accessibility for human-computer interfaces*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14915-1 and the following apply.

3.1
content chunk
unit of content that satisfies a requirement of a specific task for a specific user

NOTE 1 A content chunk can also meet other requirements of one or more tasks for one or more users, either by itself or in combination with other content chunks.

NOTE 2 A content chunk defines a subtopic that justifies separate consideration by the user. However, designers may decide whether or not to present one or more content chunks together within a single presentation segment.

EXAMPLE A research report is divided into five content chunks that deal with: background information, methodology, results, conclusions, and recommendations.

3.2
presentation segment
unit of design which consists of one or more content chunks which together present part of an application

EXAMPLE A Web page is used to present information about some topic.

3.3
media object
component of a multimedia application that is implemented by a single media type

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EXAMPLE 1 A text object presenting a discussion about some topic.

EXAMPLE 2 An image object presenting a picture of some person.

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EXAMPLE 3 A sound object presenting a song.

3.3.1
composite media object
either a single media object that is used on its own or a combination of media objects which are used together and presented synchronized with one another and/or automatically linked to one another

NOTE Some objects, such as movies, may naturally contain multiple media.

EXAMPLE 1 A moving image object and a sound object are to be played in synchronization with each other and with a single set of play, pause, and stop controls to effect the playing of both.

EXAMPLE 2 A series of songs are played one after another with a single set of play, pause, and stop controls to effect the playing of the entire series.

3.4
navigation techniques
different techniques of implementing navigation which can include: automatic, predetermined, user determined or adaptive determined

NOTE A combination of these navigation techniques can be used in different parts of a multimedia system.

3.4.1
automatic navigation
navigation where content is presented by the system without user's input

EXAMPLE Audio is presented automatically along with video.

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3.4.2
predetermined navigation
navigation where the user has only one choice of where to go next, but where the user has control over when to go to this next content

EXAMPLE Upon answering question 2 in a quiz, the user is sent to question 3.

3.4.3
user-determined navigation
navigation where the user can choose which content to go to next from a number of options

EXAMPLE The user selects between going into further details in a topic and going on to the next topic.

3.4.4
adaptive determined navigation
navigation where the choices available are determined by the system based on the content and some combination of: an individual's history, an individual's personal characteristics, a group's social history, and/or a group's characteristics

EXAMPLE The system limits the choices presented based on a profile of the user's interests.

3.5
content structure
⟨multimedia applications⟩ composed of a number of content chunks that are related together in one or more logical manners

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3.6
navigation structure
⟨multimedia application⟩ composed of a number of media objects, presentation segments, and navigation techniques that allow a user to move between related media objects and presentation segments

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3.7
basic structures
structures used as the basis for creating all other structures

NOTE The three basic structures are linear structures, tree structures, and network structures.

3.7.1
linear structures
structures that organize their elements in a sequence

NOTE 1 Linear structures may include sequences where media objects are presented in parallel.

NOTE 2 An example of a linear structure of content chunks or presentation segments is illustrated in Figure 1.

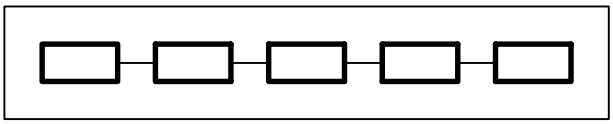

Figure 1 — Example of a linear structure

3.7.2
tree structures
structures that organize their elements in a hierarchical manner, where each component is associated with only one higher-level component and may be associated with multiple lower-level components

NOTE An example of a tree structure of content chunks or presentation segments is illustrated in Figure 2.

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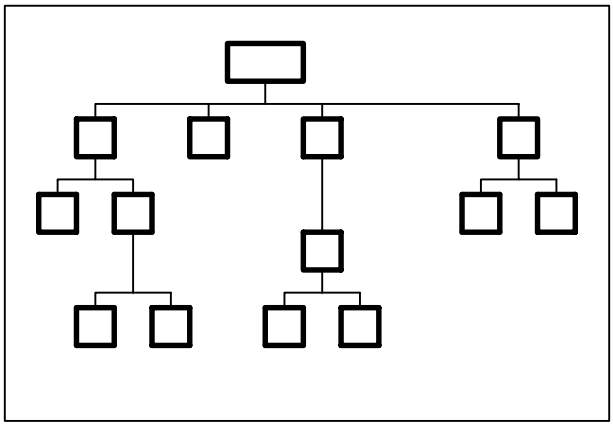

Figure 2 — Example of a tree structure

3.7.3
network structures
structures that organize their elements in a manner where each component may be associated with multiple other components

NOTE An example of a fully connected structure of content chunks or presentation segments, where all chunks or presentation segments are connected to all other content chunks or presentation segments, is illustrated in Figure 3. An example of a partly connected structure of content chunks or presentation segments, where all content chunks or presentation segments are not necessarily connected to all other content chunks or presentation segments, is illustrated in Figure 4.

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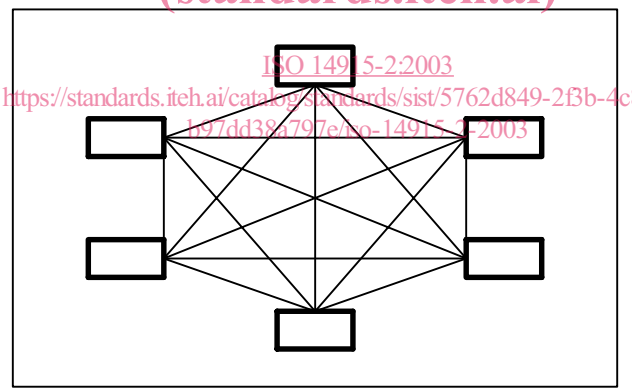

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Figure 3 — Example of a fully connected network structure

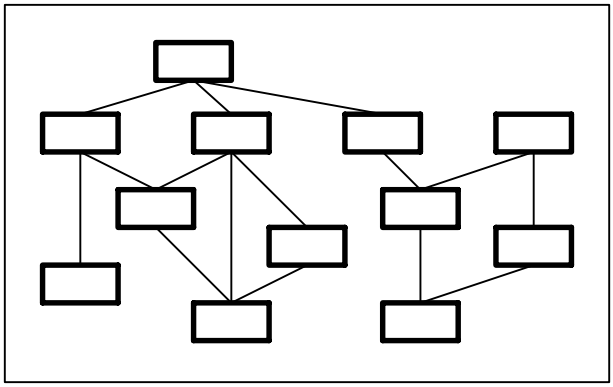

Figure 4 — Example of a partially connected network structure

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3.8
control
object, often analogous to physical controls, which allows a user to take some action which manipulates data, other objects or their attributes

3.8.1
navigation control
control that allows users to navigate within an application

3.9
link
connection, among or within media, which starts with a control and ends at a specified location

3.9.1
system-activated link
link that is activated by some system action

EXAMPLE A link is activated by the completion of some time delay in an automatic slide show.

3.9.2
user-activated link
link that is activated by some user action

EXAMPLE 1 A link is activated by the user placing the cursor over the link and clicking on the left mouse button.

EXAMPLE 2 A link is activated by the user selecting the third choice in a menu of links.

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3.9.3
fixed link
permanent link that can be activated whenever the medium containing the link is presented

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EXAMPLE 1 The user clicks on a word and is provided with a description of what the word means.

EXAMPLE 2 The user clicks on an animated icon which starts a video presentation.

3.9.4
temporal link
link that is only available for a certain period of time while the medium containing the link is presented

EXAMPLE 1 Links to descriptions of characters are made available only while the characters are visible in a video sequence.

EXAMPLE 2 A link to descriptive information is available only during the first 20 s of viewing a picture.

3.9.5
computed link
temporary link, created on demand where the location linked to is dynamically determined based on the state and/or history of the system

EXAMPLE The results of a search include several links to different parts of the application that will be replaced by the results of any subsequent search.

3.9.6
user-defined link
permanent or temporal link created by a user during the use of an application that is intended to supplement the links created by the application

EXAMPLE The user creates a bookmark to go directly to a given location within an application.

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