INTERNATIONAL STANDARD

ISO/IEC 13250-5

First edition
2015-04-01

Information technology — Topic Maps —

Part 5: Reference model

Technologies de l'information — Plans relatifs à des sujets —

Partie 5: Modèle de réference

Reference number
ISO/IEC 13250-5:2015(E)

© ISO/IEC 2015



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword iv
Introduction v
1 Scope 1
2 Subjects 1
3 Subject Proxies and Maps 1
4 Ontological Commitments 2
5 Navigation 3
6 Merging 4
7 Constraints 5
8 Map Legends 6
9 Conformance 6
Annex A (normative) **Path Language** 7
Annex B (informative) **Notation** 11
Bibliography 12

© ISO/IEC 2015 – All rights reserved

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

ISO/IEC 13250-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 34, *Document description and processing languages.*

ISO/IEC 13250 consists of the following parts, under the general title *Information technology — Topic Map*:

— *Part 2: Data model*

— *Part 3: XML syntax*

— *Part 4: Canonicalization*

— *Part 5: Reference model*

— *Part 6: Compact syntax*

© ISO/IEC 2015 – All rights reserved

Introduction

The Topic Maps family of standards is designed to facilitate the gathering of all the information about a subject at a single location. The information about a subject includes its relationships to other subjects; such relationships may also be treated as subjects (subject-centric).

ISO/IEC 13250-2:2006 [1] provides a foundation for syntaxes and notations, such as those defined in ISO/IEC 13250-3 Topic Maps XML Syntax [2] and ISO/IEC 13250-4 Topic Maps Canonicalization [3]. Of necessity, ISO/IEC 13250-2:2006 [1] makes ontological commitments in terms of how particular subjects are identi_ed (topics, associations, occurrences), what properties are required, the tests to be used to determine whether two or more proxies represent the same subject, and other matters.

This part of ISO/IEC 13250 defines TMRM (Topic Maps Reference Model), which is more abstract and has fewer ontological commitments. Its purpose is to serve as a minimal, conceptual foundation for subject-centric data models such as ISO/IEC 13250-2:2006 [1], and to supply ontologically neutral terminology for disclosing these. It de_nes what is required to enable the mapping of different subject-centric data models together to meet the overall goal of the Topic Maps standards, that each subject has a single location for all the information about it.

TMRM also provides a formal foundation for related Topic Maps standards such as the ISO/IEC 19756 Topic Maps Constraint Language (TMCL) [4].

© ISO/IEC 2015 – All rights reserved

Information technology — Topic Maps — Part 5: Reference Model

1 Scope

This part of ISO/IEC 13250 specifies a formal model for subject maps, minimal access functionality and information retrieval from subject maps and a constraint framework governing the interpretation of subject maps.

Particular formalisms to constrain subject maps are not covered by this part of ISO/IEC 13250.

2 Subjects

A subject is defined in the Topic Maps family of standards as something which '[...] can be anything whatsoever, regardless of whether it exists or has any other specific characteristics, about which anything whatsoever may be asserted by any means whatsoever' (*ISO/IEC 13250-2:2006* 5.3.1). According to the TMRM, there is only one representative for subjects: subject proxies (*proxies*).

3 Subject Proxies and Maps

Proxies consist of properties. These are key/value pairs which—in turn—may contain references to other proxies. This recursive relationship is defined via two postulated sets. One is the finite set of proxy *labels*, $\mathcal{L}$. The second set is $\mathcal{V}$, a finite set of values. It contains values (such as numbers, strings, etc.), and all the labels in $\mathcal{L}$.

A *property* is the pair $\langle k, v\rangle \in \mathcal{L} \times \mathcal{V}$. The first component of this pair is called the *key*, the other the *value* of the property. The set of all such properties is denoted as $\mathcal{P}$. Keys in properties are always labels, the values in properties may be labels or any other value from the value set $\mathcal{V}$.

EXAMPLE 1 Given the label `shoesize` and the integer 43, then $\langle$`shoesize`, 43$\rangle$ is a property.

A *proxy* is a finite set of properties, $\{p_1, \ldots, p_n\}$, with $p_i \in \mathcal{P}$ (see Fig. 1). The multiset of all keys of a proxy x is retrievable via the function $keys(x)$, i.e. keys can occur more than once in a proxy with different values. The multiset of all values is $values(x)$. Particular values may appear more than once in one proxy.

EXAMPLE 2 A particular person may be represented by the following proxy: {$\langle$`shoesize`, 43$\rangle$, $\langle$`beardcolor`, `white`$\rangle$, $\langle$`beardlength`, `verylong`$\rangle$}

© ISO/IEC 2015 – All rights reserved