

## Disposition of comments on ISO Working Draft 26324

prepared by ISO TC46/SC9 Working Group 7  
(Project 26324, Digital Object Identifier system)

### Disposition of Comments

This document provides the disposition of comments of ISO/TC46/SC9 N450 (Comments on the working draft submitted with ISO/TC46/SC9 N447 dated 2006-04-20). A total of 7 sets of comments were received, divided into 43 individual comments.

The ISO Working Group TC46 SC9 WG7 (Project 26324 Digital Object Identifier System) would like to thank the National Bodies of Canada, Sweden, France, Ukraine, and U.S.A., and the liaison organizations IFPI and ISSN International for their comments.

This document contains:

- *Common issues*. This section provides answers to a number of questions and issues common to several of the national body comments, or which have been discussed during the WG meetings. The WG feels it would be helpful to have these available for consideration with the final draft of the standard.
- *Disposition of individual comments* (in document N450) from P-members and selected organisations in liaison on approved New Work Item 26324, taking into account further issues discussed during preparation of the current final draft standard. Comments are in the form of a table of responses with cross-reference to both N450 and the *Common issues* section.

### Common Issues

#### **1. Major changes made to draft standard since N447**

The draft standard has been re-worded as an abstract specification. Specific technologies used to provide implementation of the specification may change; exemplar specific technologies which meet the requirements of the specification are now removed from the standard and further discussed in informative Annexes (Handle, Contextual ontology architecture).

Definitions have been expanded and re-worded to improve clarity and ensure internal consistency of terminology (it was noted that definitions across ISO specifications are not necessarily compatible, nor need they be so, but each standard should be internally consistent.)

Scope has been clarified: the broad scope of the DOI System as an infrastructure is retained; the emphasis is on functionality provided by the system (a difference compared to other SC9 identifier systems which have scope defined not by functionality but by type of content).

Interaction with other identifier systems has been clarified: a new normative annex on "The DOI System in relation to other identifiers for content entities" has been introduced. The standard has been reworded so as to make clear that the DOI will co-operate and may be articulated with existing identifiers, with any identifier system retaining its primary autonomy.

#### **2. Current Status of Digital Object Identifier (DOI) system**

The DOI System is already in use. The aim of ISO standardisation, as invited by TC46SC9, was to codify this existing use for the benefit of the wider potential user community.

The DOI System was developed as a consortium standard (not as a proprietary product) by the International DOI Foundation, Inc., (<http://www.doi.org>) a non-stock membership corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, USA, registered on 10 October 1997, registration number 2807134 8100. The System began operation in 1999 and is in widespread use. Approximately 30 million DOI names are currently assigned by over 2,000 organisations. Any organisation can join the consortium and may assign DOI names on acceptance of standard non-discriminatory terms. The WG has avoided any statements or claims on scope etc. that might lead to anti-trust concerns.

The implementation of the DOI System as currently managed by The International DOI Foundation uses specific technologies, which are described for information in the draft standard in informative Annexes D and E, but these technologies may be replaced by future alternatives without any perturbation of the abstract DOI System specification.

The International DOI Foundation has developed intellectual property rights in the system, for the protection of the integrity of the system, and has made an appropriate ISO licensing declaration as part of the standard. The International DOI Foundation has no patents or patent applications on the DOI System, nor any current plans to develop these; appropriate ISO patent declarations have been made for any underlying patents of the illustrated exemplar implementation technologies (see 10 below).

One component of the DOI System, the DOI syntax, is the subject of an earlier ANSI/NISO Standard Z39.84 (2000, rev. 2005) "Syntax for the Digital Object Identifier" which "defines the composition and order of the unambiguous alphanumeric identifier string in the Digital Object Identifier (DOI) system used to reference an intellectual property entity in the digital environment". The current ISO draft is consistent with the earlier standard.

### **3. Terminology: DOI Name, DOI System etc**

The terminology in the standard uses the capitalised term "Digital Object Identifier" to refer to the system defined in this standard specification. This is to be distinguished from the lower case only term "digital object identifier" (a generic term, with a number of possible meanings).

As the term "DOI" is already widely known the acronym has been retained as an aid to readability, but has been more precisely qualified and defined where necessary (see 2 below). Several qualified terms such as "DOI Name", "DOI System" are used with precise meanings. As the DOI system has evolved, it has been defining appropriate terminology (e.g. <sup>1</sup>). This has evolved gradually so has not hitherto always been used consistently (although IDF members have tried to do so). An aim of ISO standardisation is to codify precise future usage. In particular (as with many other identifiers schemes – for example ISBN) a loose usage of "DOI" to mean either the *individual identifier string* or *the system which processes that identifier string* has arisen and has not been sufficiently precise.

To clarify this, changes to the initial working draft N447 were made to:

- Deprecate the use of the unqualified term "DOI" (alone).
- Use the term "DOI name" to refer to the unique character string assigned to the referent.
- Use the term "DOI system" to denote the co-ordinated interaction of the components referenced in the draft standard: i.e. syntax, description, resolution, and administration.

All other derived terms should be qualified uses of one of the above two terms where there is any danger of ambiguity: e.g. "DOI name syntax" to mean the specification for suffix and prefix in the DOI name.

The term “International DOI Foundation” (for brevity, “IDF”) is used for the body currently controlling the DOI system, and which is proposed as the ISO registration authority for the standard when approved.

#### **4. Terminology: Objects etc**

The term “object” is used with a specific sense within the DOI system. Note that the referent of an identifier is a particular object identified by a specific name, but that particular object is not necessarily the result of a resolution of the name (this is readily seen in the case of a referent which is an abstraction). The International DOI Foundation has developed DOI names as actionable persistent identifiers for content-related entities.

“DOI” is construed as “*digital identifier of an object*” (not “identifier of a digital object”); and the term “*object*” here is used in the accepted ontology sense of an entity, which may be abstract, physical or digital<sup>2</sup> since all these forms of entity are of relevance in content management (e.g. people, resources, agreements)<sup>3</sup>.

This usage is also compatible with the recent new work item proposal for a new ISO standard on Basic Rules for Identification Systems, ISO TC3/SC3 (“Basic rules for identification systems”: this proposed standard specifies “basic requirements for identification systems for the identification of objects such as products, “items”, documents, database entries, etc.) including requirements for the application of identifiers in computer sensible form, and requirements for their interchange”. The DOI System terminology is compatible with that use: “identifier of a specific object with respect to the system of which the object is a constituent, based on one or more aspects of that system”.

#### **5. Scope in relation to existing identifiers**

The scope of the DOI System refers to an infrastructure provides an infrastructure for persistent unique identification of entities; the emphasis is on functionality provided by the system (a difference compared to other SC9 identifier systems which have scope defined not by functionality but by type of content). A useful comparison of scope is with other schemes of similar very wide potential scope, such as for abstract identifiers (ITU/ISO “Object identifiers”: OIDs) and identifiers for use on the web (URI (URL and URN) schemes).

A DOI name is not intended as an alternative for other identifier schemes, but when used with them may provide additional functions, and enhance the identification functionality provided by those systems with additional functionality provided by the DOI System. The guiding principles for referencing other identifier schemes within the DOI System are to maximise utility to potential users, and to maximise efficiency among registration agencies. Guidelines for this have been provided in the draft standard (5.6, Annex C)

#### **6. Exemplar resolution technology: Handle System**

The Handle System has now been removed from the draft standard, and is now referenced (informative Annex D) as an exemplar technology used to implement the abstract DOI System specification. However since a number of specific comments were made in N450 about the handle system it is felt useful to provide a brief response to these comments.

It is necessary to distinguish between the abstract specification of the Handle System, and its reference implementation. The abstract Handle System is specified in RFCs 3650, 3651, and 3652. A reference implementation of the specification, available as Java through open source distribution, is developed and distributed by CNRI. A compliant handle service built without using any of the reference implementation code would not by definition be distinguishable from the standard version from the outside: the global Handle records give IP address, port numbers, public keys, etc., but nothing about the internals of the machinery with those handle service attributes. However, the onus would be on the developer to ensure that

this assertion of compliance was true. At least two other independent implementation of the specification has been reported to CNRI.

The Handle software has a public license, similar to an open source license, in order to enable broader use of the technology.<sup>4</sup>

## **7. Use and display of DOI names**

The DOI System is an abstract specification, but designed for use on digital networks; specifically on the Internet - the global information system that:

- (i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons;
- (ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and
- (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.<sup>5</sup>

Use of DOI names at present is primarily in web applications. A section in the standard (4.4) deals with "Visual presentation and other representation of DOI name" including in web applications. Individual applications may provide their known guidelines, consistent with this (e.g. the current dominant use of DOI names, the Crossref service, carries a section titled "Display of DOIs"<sup>6</sup>).

Use of DOI names in the context of internet applications does not stand or fall on its use in URLs, URIs; or recognition by the bodies which have standardized the URI or any of its subset specifications. At its core it stands outside of those and is not in any fundamental sense in competition with them. While that may appear to be the case in the current environment, there is continual change, as shown by the last few years of Internet evolution (peer-to- peer, Skype, etc.) which the abstract specification should remain unperturbed by. The IDF may create a specification of how to use DOI as a URI if this is felt to be useful.

The core functionality of the DOI system in a web application is to resolve a DOI to the registered URL. The DOI Proxy server - <http://dx.doi.org/> - resolves DOIs via standard HTTP protocols. In the future HTTP may no longer be the dominant protocol and browsers may handle DOIs natively.

## **8. Software aids to implementing DOI System**

The draft standard mentions aids to distributing the availability of resolution functionality – notably the use of http proxies - but does not mandate the use of any of them, current or future.

The DOI system deals with the problem of software distribution and changing nature of such aids by making DOI names usable in both native protocols or by a common proxy: many implementations of the DOI System intended to help manage web content use DOI names embedded in URLs on web pages, and for the convenience of their customers, use a proxy server implementation (dx.doi.org) which currently has the functionality of the general Handle System proxy<sup>7</sup> but may have additional functionality added in the future. A growing number of specific DOI Tools are becoming available<sup>8</sup>: some deploy native handle resolution, whilst others make use of proxies easier - e.g. Connotea, a free online reference management and social bookmarking service<sup>9</sup>, recognises and stores DOI names, enabling bookmarking a DOI name directly in web browsers. The exemplar Handle System provides clients that can be embedded in end user software (e.g. a web browser) or in server software (e.g. a web

server). Handle client software libraries in both C and Java are freely available. A growing ecology of other tools for handles is developing, both from CNRI and from outside parties.

## **9. Exemplar metadata technology: Contextual Ontology Architecture**

The *Contextual Ontology Architecture* has now been removed from the draft standard, and is now referenced (informative Annex E) as an exemplar technology used to implement the abstract DOI System specification through provision of a logically consistent DOI data dictionary. However since a number of specific comments were made in N450 about the metadata system it is felt useful to provide a brief response to these comments.

The terms used in the tables in section 8 (in N447: now annex B in the final draft standard) are not arbitrary, nor specific only to the DOI System, but result from an underlying technology – currently the COA model - which provides an internally consistent set of relationships.

We distinguish between a specification and an implementation. The COA = *Contextual Ontology Architecture* is the underlying specification and toolset used to build a number of similar contextual semantic dictionaries. The principles of process and methodology are common but different implementations of COA might decide to have different operational rules, access, fees, etc. To use this technology, any potential user has the choice of (a) put all relevant terms into an existing dictionary as is; or (b) use another implementation of the COA, either de novo, or hosted by an existing application.

The DOI System currently uses approach (b): terms are mapped into its own IDF Data Dictionary, which contain terms from some similar dictionaries (notably RDD, see below) as a subset (though it is most useful to think of these not as subsets but as views across a series of namespaces in a unified set of all terms in COA for which a particular user has access permissions), and which follows the same underlying COA model.

Another implementation of the COA is the MPEG-21 RDD = International Standard ISO/IEC 21000-6 (Information technology - Multimedia framework (MPEG-21) - Part 6: *Rights Data Dictionary*). The International DOI Foundation (IDF) is the ISO Registration Authority for ISO/IEC 21000-6. The ISO/IEC 21000-6 Rights Data Dictionary (RDD) is available at the web site <http://www.iso21000-6.net>. Technical operations of the RDD are subcontracted to Rightscom Ltd, under an agreement between the International DOI Foundation and ISO/IEC JTC1. The Dictionary is run on a cost-recovery basis. IDF is responsible for governance of the RDD but is deliberately widening participation.

The terms used in the tables in section 8 are not arbitrary, nor specific only to the DOI System, but result from the underlying COA model which provides an internally consistent set of relationships.

## **10. Costs of assigning DOIs**

In accordance with ISO guidance, discussion of the costs of assigning DOI names is not included in the standard but is to be included in a contract between ISO and the organization fulfilling the registration authority function, to be authorized by the ISO Council which normally expects such fees to be established on a cost recovery basis. However since a specific comment was made in N450 about the issue it is felt useful to provide a response.

The International DOI Foundation (IDF) currently manages the system on a cost-recovery basis and is therefore aware of the need for reasonable, cost recovery, fees. The implementation of the DOI System adds value, but necessarily incurs some costs that must be recovered in the operation of the system. The principles of the IDF are to offer resolution of DOI names at no cost; and to operate the system on a cost-recovery basis by charging for registration agencies licensed to assign DOI names under the IDF.

Many DOI Registration Agencies (RAs) will be assigning DOI names as part of a wider service offering to customers in which DOI name registration may not be a separately specified item. RAs are free to set fees independently of the IDF. This allows a range of pricing and business models using third part registration agencies, in recognition of the fact that a simple model is not a "one size fits all" solution. Registration Agencies participate in the DOI System by paying fees (of the order of a few cents per DOI name) to support central activities of the IDF. There is no limitation placed on the number of DOI name prefixes that any organization may choose to apply for.

For example, in the CrossRef system a publisher with revenues below \$1 million dollars per year may assign DOI names for the sum of \$250 per year (unlimited number of DOIs) plus a sum varying from \$0.06 to \$1.00 per DOI name depending on the nature of the material<sup>10</sup>. Other agencies have different models: for example the Office for the Official Publications of the European Union (OPOCE) assigns DOIs as part of its services to EU bodies and the cost of doing so is part of its central overhead.

## **11. *Intellectual Property issues***

DOI<sup>®</sup> and DOI.ORG<sup>®</sup> are registered trademarks and the doi> logo is a trademark of The International DOI Foundation. DOI is a registered trademark of the International DOI Foundation. These rights are declared in the draft standard. The International DOI Foundation has developed these intellectual property rights in the system, for the protection of the integrity of the system, and has made an appropriate ISO licensing declaration as part of the standard. The International DOI Foundation has no patents or patent applications on the DOI System, nor any plans to develop these.

The exemplar resolution technology the Handle System is the subject of US Patent 6,135,646: System for Uniquely and Persistently Identifying, Tracking and Managing Digital Objects, held by Corporation for National Research Initiatives (CNRI), a non-profit research and development corporation. CNRI licenses its Handle System technology for use by the general public. The Public License allows commercial and non-commercial use of both its patented technology and the reference implementation of the software allows the software to be freely embedded in other systems and products<sup>11</sup>. Handle System, Handle.net and Global Handle Registry are CNRI trademarks registered in the U.S. Patent and Trademark Office.

The exemplar metadata technology the Contextual Ontology Architecture builds on US Patent 7,124,364: Data dictionary method, held by CONTECS:DD LLC. This patent held by the CONTECS:DD consortium was earlier also declared as part of International Standard ISO/IEC 21000-6 (Information technology - Multimedia framework (MPEG-21) - Part 6: Rights Data Dictionary) and stated to be available under license under reasonable and non-discriminatory terms.

In each case, for the avoidance of doubt, a Patent Statement and Licensing Declaration for ISO/IEC Deliverable has been filed as part of the activity of ISO Working Group TC46 SC9 WG7 (Project 26324 Digital Object Identifier System): these declarations do not represent an actual grant of a license. In each case, the Patent Holder declares it is prepared to grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations of the relevant document.

**Disposition of Comments: Response to detailed comments (N450)**

Comments are considered in the order presented in N450. Comments have been summarised or extracted in some cases, see N450 for full comment.  
(E)=Editorial comment (i.e. concerns layout, format, etc.)

<i>Origin</i>	<i>Comment (E)=Editorial comment</i>	<i>Page N 450</i>	<i>Ref. N 447 sect.</i>	<i>Disposition</i>	<i>Ref in final draft stnd.</i>	<i>See# in Common Issues above</i>
Canada	Concern re inclusion of Handle System	4		(1) Concerns were not specified. (2) Handle System is no longer part of normative standard but included as an informative annex as an exemplar technology (currently used by the International DOI Foundation).	Annex D	1, 6
Sweden	Referent. "A DOI must resolve to some kind of object digital or physical..it cannot resolve to an abstraction..."	4	3.1	Referent is defined as particular object identified by a specific DOI name. The term "object" is used with a specific sense within the DOI system. The referent of an identifier is a particular object identified by a specific name, but that particular object is not necessarily the result of a resolution of the name (this is readily seen in the case of a referent which is an abstraction).	3	4
	(E) Definitions punctuation requires correction.	4	3	Accepted.	-	-
	Structural types: explanation to be added re expression and abstraction	4	8.3 table 1	(Now table 1 in Annex B). These terms are used in a specific sense: the underlying model of making derived from COA is centred on two verbs: <i>Express</i> and <i>Abstract</i> , and on two subtypes of <i>Express</i> ( <i>Fix</i> and <i>Perform</i> ): <i>Express</i> : To make a Perceivable Resource (a Manifestation), subtypes <i>Fix</i> (To Express a Persistent Manifestation), <i>Perform</i> (To Express a Transient Manifestation). <i>Abstract</i> : To Derive a new Conceptual Resource from a Manifestation. The families of these verbs include the nouns Manifestation, Expression, Performance, Fixation and Abstraction. The document "The Model of Making in indecs and RDD" ISO/IEC JTC1/SC29/WG11/M12159 shows the model of making, with term names as used in RDD and subsequent standards. It is not necessary to understand this derivation in order to use the DOI system or its component Data Dictionary.	Annex E	9

	Structural types: clarify what is meant by performance re element "StructuralType"	4	8.3 table 1	See previous response. A rights statement, for example, may wish to specifically identify a performance to cover subsequent derivative works.	Annex E	9
	Resource Type: clarify what is meant by "abstractions"	4	8.3 table 1	See previous response. <i>Abstract</i> : To Derive a new Conceptual Resource from a Manifestation.	Annex E	4, 9
	Re-word to avoid mention of both "Entity of intellectual property" and "content object" synonymously	5	5.1	Accepted. Definitions have been expanded and re-worded to improve clarity and ensure internal consistency of terminology.	3	4
France	Focus and Scope not clearly defined	5	All	"Scope" and "Terms and definitions" have been expanded and re-worded to improve clarity and ensure internal consistency of terminology.	1, 3	3,4,5
	Definition of objects identified is missing	5	All	Now included in section 3, Terms and definitions.	3	4
	References list is insufficient, should include relevant ISO identifiers	5	2 p1	It was decided not to include specific references to other ISO schemes, but to deal with this issue comprehensively as a general matter in 5.6 and Annex C	2	5
	Terms and definitions inconsistent with other ISO standards	5	3 p1	Definitions across ISO specifications are not necessarily compatible, nor need they be so, but each standard should be internally consistent.	3	1
	DOI assignment is prohibitively expensive	5	5.1	(1) This is a mis-perception incorrect; see (1) above. (2) In accordance with ISO guidance, discussion of the costs of assigning DOI names is not included in the standard, but is discussed in (10) above.	Annex A	10

	DOI Resolution is via Handle System which is very scarcely used	5&6	6	(1) This is not correct. (2) Handle System is no longer part of normative standard but included as an informative annex as an exemplar technology (currently used by the International DOI Foundation). (3) Handle System is in widespread use (see <a href="http://www.handle.net/apps.html">http://www.handle.net/apps.html</a> ); some uses may be via proxies or other software interfaces.	6, Annex D	6,7,8
	A standard should not be based on a given marketed tool	6	6	The standard is now an abstract specification, which can be implemented with any tools which meet the requirements of the specification	Int., Annex D Annex E	1
	IESG has expressed strong reservations re Handle	6	6	(1) Handle System is no longer part of normative standard but included as an informative annex as an exemplar technology (currently used by the International DOI Foundation). (2) The comments that Handle "had been submitted as RFC (RFC 3650) to IETF, and in 2003, IESG has expressed strong reservations which resulted in leaving this document at the information stage" is a misunderstanding, or mischaracterization, of an Informational RFC. An Informational RFC is NOT a milestone on the way to a standards track RFC. These were submitted as, and always intended to be, Informational RFCs. An informational RFC can be nearly anything; the nature of IETF is that some become widely recognized essential RFCs: one of the best known informational RFCs is RFC 1591, March 1994 "Domain Name System Structure and Delegation". An Informational RFC is just that - assumed to be of interest and intended as useful information for the IETF community. The IETF was not involved in the development of the Handle System and did not 'leave it' at an inferior stage. Some individuals in the IESG at that point in time had strong opinions on URNs and naming and overstepped by pointing out that this wasn't an IETF developed standard - a clearly redundant statement in an Informational RFC.	Int., 6, Annex D	1,6
	CNRI Handle System Resolver availability is a concern	6	6	(1) See above (2) Handle URI Resolver is available at <a href="http://www.handle.net/other_software.html">http://www.handle.net/other_software.html</a>	6, Annex D	1, 6
	DOI kernel metadata: inconsistent	6	8.3 tab. 1	(Now table 1 in Annex B). The terms are consistent, and derived from the underlying model of making from COA.	7, Annex B Annex E	9

Ukraine	(E) Examples should be numbered	6		Accepted.		
	(E) Centre table headers	6	8.3 table 1-3	Accepted.	Annex B Annex F	
USA	"DOI" is not the system it is the string	6	All	Ambiguity of usage, now corrected.	3	1, 3
	Would entities other than "content entities" be out of scope?	6	All	No. Section 3, definitions, now explicitly states that the entity may be abstract, physical or digital, as any of these forms of entity may be of relevance in content management (and may include e.g. people, resources, agreements).	3	4
	Address how the DOI System will accommodate changes in any other identifiers which are incorporated	6	All	For the purposes of the DOI system, a DOI name is a non-intelligent identifier: meaning should not be imputed to the DOI name string other than that obtained through resolution. Relations with other identifiers will be dealt with through mutual agreements with the appropriate registration authority.	5.6	5
	More rigorous clarification needed of terms such as register, assign, allocate, deposit etc.	6	7.3.1	Accepted. Definitions have been expanded and re-worded to improve clarity and ensure internal consistency of terminology.	2, 5	1, 3, 4
	(E) Revise introduction and annex for grammar and readability	7	Intro, Annex A	Accepted	All	
	(E) references to ISO standards should omit year to indicate current version	7	2	References to ISO standards have been dropped. It was decided not to include specific references to other ISO schemes, but to deal with this issue comprehensively as a general matter in 5.6 and Annex C		
	Add separate clause on DOI prefix	7	4.1	Accepted. Section 4.2 now does this.	4.2	

	Address situation where DOI agency is no longer available	7	4.1, 7.3.1	Part of the role of Registration Authority and DOI Registration Agencies; see now Annex A.	Annex A	2
	Identify how metadata elements can be updated	7	8.3 Table 1	Metadata elements are determined by the system (external to the DOI specification) chosen to meet the specification. The technologies to deploy the DOI Metadata functionality shall be selected by the ISO Registration Authority for the DOI System. The ISO registration authority for the DOI System will ensure that any change of selected technology to meet the functional needs at any point will be compatible with earlier DOI applications.	Annex B Annex E	Annex A Annex B Annex E
IFPI	Document trademark and license issues	7	1, Foot note	Accepted. Now included.	8.2	2, 11
ISSN	Define DOI purpose and functions in a new section/clause	7	1	New "Introduction" and "1. Scope"	Int, 1	1, 3, 4
	Explain further perceived potential overlap with other systems	8	1	Accepted. Now specifically addressed in section 5.6 and Annex C.	5.6, Annex C	5
	Standardization implies standardizing the Handle System.	8		Handle System is no longer part of normative standard but included as an informative annex as an exemplar technology (currently used by the International DOI Foundation).	6, Annex D	1, 6
	Patent rights should be clarified	8		Accepted. See discussion in (11) above.		2, 11
	Definition of purpose is multiple and inconsistent: revise.	9		Accepted. New "Introduction" and "1. Scope"	Int, 1	1, 3, 4
	References should be expanded and mention relevant ISO standards	9	5.1	It was decided not to include specific references to other ISO schemes, but to deal with this issue comprehensively as a general matter in 5.6 and Annex C	2	5

	Correct the usage, and add definitions, of referent, ontology, persistent, unique	9	5.2	Accepted.	3, 5	1, 3, 4
	Correct the example given of use with ISSN	9	4.2	Accepted	5.6	-
	Clarify wording re unique assignment	9	5.3	Accepted.	5.4	1
	"In certain cases it is allowable for no metadata registration to be made": explain and deal with issues arising	10	5.4	Corrected. This exception is no longer part of the specification.	7	-
	(E) DOI metadata general: reword to make clearer	10	8.1	Accepted.	7, Annex B Annex F	9
	Registration of metadata: explain where metadata is held and distinguish between record of metadata and DOI record	10	8.2	Accepted	7, Annex A Annex B Annex F	9
	Add ISSN to 8.3 table 1 under resourceidentifier(s)	10	8.3 Table 1	Accepted (now Table 1 in Annex B)	Annex B	-
	Disagreement with phrase "Making numbering schemes actionable in digital networks"	10	Annex B	Clarified; now more precisely described in Introduction: "A DOI name can, within the DOI system, be resolved to values of one or more types of data relating to the object identified by that DOI name, such as a URL, an e-mail address, other identifiers, and descriptive metadata."	Int.	-

### **Footnote references**

---

- <sup>1</sup> DOI: A 2003 Progress Report <http://www.dlib.org/dlib/june03/paskin/06paskin.html>
- <sup>2</sup> J. F. Sowa "Knowledge Representation: Logical, Philosophical and Computational Foundations. " Brooks/Cole, Pacific Grove, CA, 2000.  
<http://www.jfsowa.com/krbook/index.htm>
- <sup>3</sup> G. Rust and M. Bide: The <indec> Metadata Framework: Principles, model and data dictionary (2000): <http://www.indec.org/pdf/framework.pdf>
- <sup>4</sup> <http://www.handle.net/faq.html#license>
- <sup>5</sup> [http://www.cnri.reston.va.us/what\\_is\\_internet.html#xv](http://www.cnri.reston.va.us/what_is_internet.html#xv)
- <sup>6</sup> [http://www.crossref.org/02publishers/15doi\\_guidelines.html](http://www.crossref.org/02publishers/15doi_guidelines.html)
- <sup>7</sup> Handle System Proxy Server System: <http://www.handle.net/proxy.html>
- <sup>8</sup> International DOI Foundation, "DOI System Tools", <http://www.doi.org/tools.html>
- <sup>9</sup> B. Lund et al., "Social Bookmarking Tools (II) A Case Study – Connotea" D-Lib magazine (2005) <http://www.dlib.org/dlib/april05/lund/04lund.html>
- <sup>10</sup> Crossref.org: publisher fees [http://www.crossref.org/02publishers/20pub\\_fees.html](http://www.crossref.org/02publishers/20pub_fees.html)
- <sup>11</sup> CNRI announces Public Release of its Handle System® Technology; June 2006  
[http://www.handle.net/news/press\\_release\\_1.html](http://www.handle.net/news/press_release_1.html)