

# ISO/IEC 20016-1:2014-02 (E)

## Information technology for learning, education and training - Language accessibility and human interface equivalencies (HIEs) in e-learning applications - Part 1: Framework and reference model for semantic interoperability

<b>Contents</b>	<b>Page</b>
Foreword .....	viii
Introduction.....	ix
0 Introduction.....	ix
0.1 Purpose and overview .....	ix
0.2 Benefits to implementers of this multipart ISO/IEC 20016 standard .....	x
0.3 Primary sources of requirements .....	xi
0.4 Key concept of “individual accessibility” .....	xiii
0.5 Holistic approach .....	xiv
0.6 Use of "jurisdictional domain", jurisdiction, country .....	xix
0.7 Use of "person", "individual, "organization", "public administration" and “person” .....	xx
0.8 Importance of definitions and terms .....	xxi
0.9 Standard based on rules and guidelines .....	xxii
0.10 Size of document and role of “iso/iec 20016-1 framework and reference model for semantic interoperability” .....	xxii
0.11 Organization and description of document.....	xxiii
1 Scope .....	1
1.1 Statement of scope – Multipart standard.....	1
1.2 Scope of this part of ISO/IEC 20016 “framework and reference model for semantic interoperability” .....	2
1.3 Exclusions.....	3
1.3.1 Physical aspects of individual accessibility.....	3
1.3.2 Person: individuals, organizations, and public administrations.....	3
1.3.3 Artificial languages: Programming languages, Mark-up languages, etc .....	3
1.3.4 Non-recorded information .....	4
1.3.5 Determining the individual's capability(ies) to communicate in a language(s).....	4
1.3.6 Universal design and related Functional Services View (FSV) aspects .....	4
1.3.7 General aspects of culture and environment .....	5
1.4 Aspects not currently addressed in this 1edition.....	5
1.4.1 Introduction - Focus and scope of 1 edition of ISO/IEC 20016-1 .....	5
1.4.2 The creation of accessible HIEs .....	5
1.4.3 Rules and procedures governing the four quadrants (each or combinations) of the Human Interface Equivalency Model (HIEM) .....	5
1.4.4 Creation of abbreviations and acronyms as HIEs .....	6
1.4.5 Template for specifying semantic interoperability requirements .....	6
1.4.6 Localization aspects .....	6
1.4.7 Various aspects of HIE semantic collaboration space (SCS).....	6
1.4.8 Role of an “AfA agent” .....	6
1.4.9 Privacy protection, consumer protection, human rights, etc.....	7
1.5 IT-systems environment neutrality.....	7
2 Normative references.....	8
3 Terms and definitions .....	8
4 Symbols and abbreviated terms .....	35
5 Conformance .....	37
5.1 Introduction.....	37
5.2 Conformance to this part of ISO/IEC 20016 “framework and reference model”.....	37
6 Fundamental principles and assumptions .....	37
6.1 Introduction.....	37
6.2 Principles governing the ISO/IEC 20016 multipart standard .....	39

6.2.1	Principle #1 - Support the requirements of the <i>UN Convention on the Rights of Persons with Disabilities</i> .....	39
6.2.2	Principle #2 - Support requirements of jurisdictional domains on language accessibility and Human Interface Equivalents (HIEs) .....	39
6.2.3	Principle #3 - Support linguistic diversity and cultural adaptability of individual users around the world.....	40
6.2.4	Principle #4 - Inclusive design .....	40
6.2.5	Principle #5 - Multiple source languages .....	41
6.2.6	Principle #6 - Rule-based approach.....	41
6.2.7	Principle #7 - Ability to support various levels of granularity and scale-ability .....	42
6.2.8	Principle #8 - Integrated approach to internal and external constraints .....	42
6.2.9	Principle #9 - Maximize use of existing international standards and specifications .....	43
6.2.10	Principle #10 - Maximize an approach which is systematic, IT-enabled, supports computational integrity, and yet is (specific) IT-platform neutral .....	43
6.2.11	Principle #11 - Support the three strategic directions of ISO/IEC JTC1 standards development namely: (1) portability; (2) Interoperability; and, (3) and cultural adaptability.....	44
6.3	Added principles governing the development of ISO/IEC 20016-1 .....	44
7	Semantic interoperability and levels of semantic equivalency .....	44
7.1	Introduction .....	44
7.2	Summary of UN convention (and related requirements).....	44
7.3	Levels of semantic equivalence .....	45
8	Public policy requirements of jurisdictional domains .....	47
8.1	Introduction .....	47
8.2	Jurisdictional domains and public policy requirements .....	47
8.3	Individual accessibility.....	48
8.3.1	Introduction .....	48
8.3.2	<i>UN Convention on the Rights of Persons with Disabilities</i> as a key public policy requirement .....	48
8.3.3	Individual accessibility.....	49
8.4	Consumer protection .....	51
8.5	Privacy protection.....	52
8.6	Human rights (other) .....	53
8.7	Public policy requirements and localization aspects .....	53
8.8	Use of “AFA agents” and third parties in decision-taking and commitment-making .....	54
9	Semantic collaboration space and levels of semantic unambiguity.....	54
9.1	Introduction .....	54
9.2	(HIE) Semantic Collaboration Space.....	56
9.3	Two perspectives of a Semantic Collaboration Space (SCS): Semantic Operational View (SOV) AND Functional Services Support View (FSSV) .....	58
10	Rules governing use of language and language accessibility .....	59
10.1	Introduction .....	59
10.2	Choice of language – internal constraints perspective .....	60
10.3	Choice of language – external constraints perspective .....	62
10.3.1	Introduction .....	62
10.3.2	Official (or “de facto”) language .....	62
10.3.3	Legally Recognized Language (LRL).....	64
10.4	Individual accessibility language.....	65
10.5	Gender, and official, de facto, or LRL languages.....	65
10.6	Declared Semantic Equivalent (DSE) .....	67
11	Levels and degrees of linguistic equivalence .....	67
11.1	Introduction .....	67
11.2	Levels of lexical (quantitative) equivalency.....	68
11.3	Degrees Of Linguistic Equivalences (DLE).....	68
11.4	Use of ISO 5964 in ISO/IEC 20016 .....	68
12	Human Interface Equivalency Model (HIEM).....	69
12.1	Introduction .....	69
12.2	Approach and key requirements.....	69

12.3	The Human Interface Equivalency Model (HIEM) itself .....	70
12.4	Role of a HIE identifier .....	72
13	<b>Template for specifying individual accessibility requirements applicable to any HIE as a SRI.....</b>	<b>72</b>
13.1	Introduction to and purpose of template .....	72
13.2	Template structure and content.....	73
13.2.1	IT-interface needs perspective.....	73
13.2.2	Human interface needs perspective.....	74
13.3	General rules governing use of template.....	75
13.4	Specific rules governing entries in the template .....	75
13.5	Template.....	75
14	<b>Rules governing the structure, management and addition of new parts of this multipart standard .....</b>	<b>75</b>
14.1	Introduction.....	75
14.2	Default template for “table of contents” of parts of ISO/IEC 20016 .....	75
14.3	Reserve ISO/IEC 20016-10 for a consolidated vocabulary.....	77
Annex A	<b>(normative) Consolidated list of terms and definitions with cultural adaptability: ISO English and ISO French language equivalency .....</b>	<b>78</b>
A.1	Introduction.....	78
A.2	ISO English and ISO French.....	78
A.3	Cultural adaptability and quality control.....	78
A.4	Organization of ANNEX A - Consolidated list in matrix form .....	79
A.5	Consolidated list of ISO/IEC 20016-1 Terms and definitions.....	80
Annex B	<b>(normative) Impacts and requirements of the UN Convention on the Rights of Persons with Disabilities on requirements for semantic interoperability for language accessibility and Human Interface Equivalents (HIEs) .....</b>	<b>147</b>
B.1	Introduction and purpose .....	147
B.2	Summary overview .....	147
B.3	Impact of the UN Convention on Rights of Persons with Disabilities (2006).....	151
B.3.1	Objective of Clause B.3.....	151
B.3.2	Key objectives and requirements of the UN Convention impacting ISO/IEC 20016-1 Framework and Reference Model .....	151
Annex C	<b>(normative) Degrees of linguistic equivalences based on ISO 5964 .....</b>	<b>155</b>
C.1	Introduction and context .....	155
C.2	Purpose .....	155
C.3	Summary of ISO 5964 Degrees Of Linguistic Equivalence (DLE) .....	155
C.4	Application and use of ISO 5964 in an ISO/IEC 20016-1 context.....	157
Annex D	<b>(normative) Individual Accessibility Model: (IAM) .....</b>	<b>159</b>
D.1	Introduction.....	159
D.2	Purpose .....	160
D.3	Key elements of the Individual Accessibility Model (IAM).....	160
D.3.1	Introduction.....	160
D.3.2	Summary overview of Business Transaction Model (BTM).....	160
D.3.3	Three key elements of the individual accessibility model .....	163
Annex E	<b>(normative) Default conventions for unambiguous identification and referencing of codes representing jurisdictional domains (countries), languages and currencies in support of semantic interoperability .....</b>	<b>165</b>
E.1	Introduction.....	165
E.2	Purpose .....	167
E.3	Exclusions to Annex E.....	167
E.4	Current issues and approach taken .....	168
E.4.1	Summary of nature of issues pertaining to interworking of codes representing countries, languages, and currencies .....	168
E.4.2	ISO 3166-1 “Country Codes”.....	169
E.4.3	ISO 639-2 “Language Codes”.....	170
E.4.4	ISO 4217 “Currency Codes” .....	171

E.5	Principles governing approach taken .....	171
E.6	Common default conventions .....	172
E.6.1	Default convention #1 for the unambiguous identification and referencing of combinations of codes representing countries, languages and currencies in support of semantic interoperability .....	172
E.6.2	Default convention #2 for the ordering of codes representing countries, languages and currencies.....	172
E.7	Application of default convention #1 for identifying codes representing countries, languages and currencies with default convention #2 for ordering them.....	173
E.8	Examples of applying “default convention #1”” in an ITLET context.....	173
Annex F	(normative) Classes of constraints .....	174
F.1	Introduction .....	174
F.2	Purpose.....	174
F.3	Constraints: internal and external .....	174
Annex G	(informative) Summary on issues of language equivalencies.....	179
G.1	Introduction and context.....	179
G.2	Purpose.....	180
G.3	Summary notes on “language equivalency” .....	180
G.4	Bibliography .....	183
Annex H	(informative) Examples of multiple Human Interface Equivalents (HIEs) for a single IT-Interface Identifier.....	185
H.1	Purpose and use of Annex H.....	185
H.2	Example 1: Taken from ISO 19135:2005 (E) .....	185
H.3	Example 2: Taken from ISO/IEC 5218:2004.....	187
Annex I	(informative) Examples of the need for specifying gender of terms and nouns to ensure unambiguity in the use of an official language .....	190
I.1	Introduction .....	190
I.2	Organization of the ANNEX I matrix.....	190
I.3	Examples of the same word having two gender forms and two different meanings .....	191
Annex J	(informative) Case study of multilingual retrieval of HIEs for unilingual users: the “potato” .....	192
Annex K	(informative) Notes on standard table of contents template for parts 2+ of ISO/IEC 20016 ...	195
K.1	Introduction .....	195
K.2	Notes on Clause 0 Introduction.....	195
K.3	Notes on Clause 1 Scope .....	195
K.4	Notes on Clause 2 Normative references.....	196
K.5	Notes on Clause 4 Symbols and abbreviated terms .....	196
K.6	Notes on Clause 5 Conformance .....	196
K.7	Notes on Clause 6 Fundamental principles and assumptions .....	196
Annex L	(informative) ISO/IEC 14662 open-edi reference model, commitment exchange and collaboration space .....	197
L.1	Introduction .....	197
L.2	Relevance of open-edi reference model.....	198
L.3	Basic aspects of open-edi collaboration space: content provider and individual user.....	199
Annex M	(informative) Implementation considerations for the ISO/IEC 20016-1 <i>Framework and reference model</i> .....	203
M.1	Introduction .....	203
M.2	Purpose.....	203
M.3	Implementation considerations.....	203
M.3.1	Application of Clause 1.4 “Aspects not currently addressed in this 1 <sup>st</sup> edition” .....	203
M.3.2	Implementation of individual accessibility as a human right is enforced by jurisdictional domain requirements .....	203
M.3.3	Intended use of a SRI as prepared by a content provider .....	204
M.4	Example case studies as “scenarios” .....	205
Annex N	(informative) Contributors and acknowledgement.....	208
	Bibliography.....	209