



# ISO/IEC JTC 1/SC 25 N 1663

Date: 2009-06-16

Replaces ISO/IEC JTC 1/SC 25 N/A

**ISO/IEC JTC 1/SC 25**  
**INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT**  
**Secretariat: Germany (DIN)**

**DOC TYPE:** Voting report

**TITLE:** Voting report on ISO/IEC JTC 1/SC 25 N 1628: ISO/IEC CD 18012-2: Information technology — Home Electronic System — Guidelines for product interoperability — Part 2: Taxonomy and lexicon

**SOURCE:** SC 25 Secretary

**PROJECT:** 25. 01.07-02

**STATUS:** The NWIP has been distributed with JTC 1 N 5520. The work has been approved as recorded in SC 25 N 5652.  
A CD was distributed for comment with SC 25 N 1268. The comments have been distributed with SC 25 N 1312A and resolved as recorded in SC 25 N 1627. The text has been revised taking into account these resolutions as well as other ideas and was distributed with SC 25 N 1628 as 1st CD for approval as FCD.  
The document did not find substantial support for the following reasons:  
- Less than 2/3 of the P-members who voted, voted positively.  
- More than 1/4 of the Member Bodies who voted, voted negatively.  
The document is returned to WG 1 with the request to resolve the comments and to update the text ready for another CD vote.

**ACTION ID:** FYI

**DUE DATE:** n/a

**REQUESTED ACTION:** For information

**MEDIUM:** Def

**DISTRIBUTION:** ITTF, JTC 1 Secretariat  
P-, L-, O-Members of SC 25

**No of Pages:** 28 (including cover)

Title

**SC 25 N 1663 Voting report on SC 25 N: 1628**

**Vote on CD ISO/IEC 18012-2**

**NO SUBSTANTIAL  
SUPPORT**

**Information technology — Home Electronic System — Guidelines for  
product interoperability — Part 2: Taxonomy and lexicon**

**RESULT OF VOTING not counting abstentions as votes**

P-Members voting: 8 in favour out 16 of = 50 % (requirement >= 66,66%) of those who have voted

P- Members voting: 8 negative votes out of 16 = 50 % (requirement <= 25%)

P-Members reacting: 19 out of 29 = 65,55 % (requirement >= 50%)

Country	Member		Yes	No	abst.	Comments		Comment
						given	#	
Australia	SAI	P	1					
Austria	OVE	P	1					
Belgium	BEC-CEB	P		1		1	1	
Canada	SCC	P		1		1	5	
China	CESI	P	1					
Czech Republic	CSNI	P	1					
Denmark	DS	P		1		1	7	
Finland	SFS	P		1		1	17	
France	AFNOR	P			1	1	10	
Germany	DKE	S		1		1	48	
India	BIS	P						
Ireland	NSAI	P						
Israel	SII	P						
Italy	UNI	P		1		1	1	
Japan	JISC	P	1			1	27	
Kazakhstan	KAZMEMST	P						
Korea, Republic of	KATS	P	1					
Lebanon	LIBNOR	P						
Mexico	DGN	P	late					late
Netherlands	NEN	P			1			
New Zealand	SNZ	P						
Norway	NEK	P						
Poland	PKN	P						
Singapore	SPRING	P	1					
Spain	AENOR	P			1			
Sweden	SNC	P		1		1	16	
Switzerland	SNV	P		1		1	5	
United Kingdom	BSI	P						
USA	ANSI	P	1			1	17	
P-Members	29							
			8	8	3	11	154	
			50,0%	50,0 %				

Comments on SC 25 N 1628: 1<sup>st</sup> CD 18012-2: Information technology — Interconnection of information technology equipment — Home Electronic System — Guidelines for product interoperability — Part 2: Taxonomy and lexicon

E: editorial, G: general, T: technical

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
		whole document	G	Ca1	The document appears to be in an unfinished state. For example key definitions are missing whilst some of those provided are not being used. The concept of interoperability is not clearly developed and explained in unambiguous terms. Partly, text seems to have been excerpted from different sources and merged in this document.	Rework the document for better clarity in description of the interoperability concept.	
			G	Fr02	Many clauses of this document are very difficult to read. Many definitions are difficult to understand, and have no possible translation in French.		
			G	J17	Difficult to understand for the actual system designing	Add the explanation for the sequence of xml data exchange as chapter 10. The sequence of Commons, base types, base definitions, binding map, etc. shall be described.	
All	All	5 to 9	G/T	BEIT	At best, the document provides mechanisms how automation systems could be described according application domains, functional objects, application objects and properties. The guarantee of interoperability according to this international standard relies so heavily on the manufacturer specific executable code needed in the end to map formats from one implementation flavour to another, that the benefit of the international standard is highly debatable. What's the purpose of a gateway complying with this standard, when all it can deliver is a description of its functionality, but still requiring manufacturer specific mapping of underlying data messages exchanged? Then the standard does not do more than what is already common practice in the market place today by manufacturer specific gateway solutions.	This version of the standard (again) does not solve the implementation differences between underlying systems. It shall be completely rewritten in such a way that it imposes more stringent rules on information encoding that would do away with the need for additional executable code to map formats from one implementation flavour to another. It shall however be borne in mind that for this, standards may already exist today (ISO 29341, ISO 16484).	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
			G	Fr01	<p>FRNC welcomes this document whose aim is to help manufacturers as well as installers to better assure interoperability among networks.</p> <p>Nevertheless the document suffers of a lot of drawbacks, which lead FRNC to cast an abstention:</p> <p>As guidelines, it should be welcome to have a list of characteristics from which manufacturers and/or installers may pick what they need to well suit the needs, applications by applications ("toolbox").</p> <p>As a standard, it is welcome to describe requirements which allow manufacturers and/or installers to have a document to refer to offer customers a "warranty" that their network offers a real interoperability.</p> <p>FRNC is aware that these two characteristics are very difficult to gather in a same document. Some work is to be done to well satisfy either manufacturers or installers regarding interoperability. For example: a Technical Report to list all characteristics of an interoperable network, and several standards to describe requirements applications by applications.</p> <p>To this general comment, FRNC offers also some comments which may help to the consistency of the topic of interoperability.</p>	<p>Clearly identify requirements that are</p> <ul style="list-style-type: none"> <li>a) Normative whatever is the application</li> <li>b) Application dependant</li> <li>c) Recommended</li> </ul> <p>In a technical report or general part, replace shall by should</p> <p>Add normative parts by application with requirements</p>	
				Fi 1	<p>A standards part 2 that is called "Taxonomy and lexicon" should not define normative behavior. This document, on the other hand, includes normative parts such as the object schema in Clause 8 and Annex B and extensive behavioral descriptions on events in Clauses 6.1 and 6.4.</p>	<p>Remove the object schema definition from this document.</p>	
				Fi 2	<p>Furthermore, although the document defines the object schemas, it does not provide specifics on how the schemas will be used in the interoperability framework. Without the description of such actual usage, it is difficult to judge if the defined object schemas are adequate to achieve the goals set forth for this interoperability framework.</p>	<p>Remove the object schema definition from this document.</p>	
			T	JP25	<p>There is no description for new entry, deletion of the devices ,so when new device appears or an existing device is detached, there is no definition for the operation.</p>	<p>Add the scheme.</p>	
			T	JP26	<p>To get the interoperability, common definition of each parameter is necessary, ex. Property name, etc.</p>	<p>Define as next part?</p>	
			T	JP27	<p>Implementation example for some protocols is necessary to ensure this document.</p>		

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
5	125	Intro	G	US-1	This document seems to assume an interaction model that is autonomous in nature and does not comprehend control applications that necessarily involve active participation by an end-user such as control of AV equipment e.g. controlling a TV viewing experience.	Add text that explains how user interaction is accommodated in ISO/IEC 18012-2.	
5	138		E	US-4	Typo	Remove comma after “LonTalk”	
5	147	Introduction	T	DK 01	The term application semantics is not well defined making it difficult to fully understand the purpose of this specification.	Define the term ‘application semantics’.	
5	147	Introduction	T	Ca 2	“Allows a rich set of application semantics to be clearly described in a common format”  Although application semantics are identified as an important piece of the “application interoperability model” a clear description of what is understood by “application semantics” is missing.	Add a) a definition for the term “application semantics” b) a clause that describes how application semantics are identified and formally defined.	
5	147	Introduction	T	SE 01	“Allows a rich set of application semantics to be clearly described in a common format”  Application semantics is a central concept in this document but it is not clear what it stands for	Clarify the concept of application semantics	
5	148 – 150	Introduction	T	DE-01	“Incorporates a simple but flexible interaction model abstraction that can represent all the potential interactions of the various system implementations (command/response, shared variable, message-oriented, etc.)”  The document does not contain a comparative table showing how different systems exchange information between system entities. Hence, stating that the interaction model abstraction can represent >all< potential interactions of various system implementations cannot be substantiated.	a) Provide a comparative table showing how different systems exchange information. b) Provide a table showing how these different methods are represented by the interaction model abstraction. c) Provide a method on how to assign different systems’ information exchange mechanisms to those of the interaction model abstraction.	
5	151 – 153	Introduction	T	DE-02	“Establishes the minimal set of common data type primitives to support unambiguous mapping of logical application data descriptions into implementation-specific binary representations.”  The document does not give guidance on how to map the data types of different systems to each other. Also, it does not provide guidance on what to do if data types exist that cannot be mapped to each other. Hence, it is more important to describe the mapping method than data type primitives. Such a method removes the need for the definition of data type primitives.	Provide the method for mapping data type primitives of different systems to each other.  Remove the definition of common data type primitives.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
5	159		G	US-6	The definition of “Protocol Level” is unclear. A protocol defines the “bits on the ‘wire’” i.e. how two entities exchange a set of semantically meaningful sequence of data. It’s unclear how this term is related to “block conditions”.	Clarify the definition of the “Protocol Level”.	
5f.	165 – 185	Introduction	T	DK 02	The term lexicon is not well defined making it difficult to fully understand the purpose of this specification.	Define the term ‘lexicon’.	
5f.	165 – 185	Introduction	T	SE 02	“With semantic level interoperability..... shared information.” This sentence contains two central concepts, namely semantic level interoperability and lexicon (conceptual schemas). None of them are well defined.	Clarify the concept of semantic level interoperability and lexicon (conceptual schemas).	
5f.	165 – 185	Introduction	E	DE- 03	“With semantic level interoperability, clashes between two application objects attempting to cooperate are caused by differences in the lexicon (conceptual schemas) that describe the components. Simply put, a mistranslation may occur between the two systems because of incomplete shared information.”  These statements are valid. Yet, the document does not provide a means to describe semantics.  It attempts to describe semantics by defining a syntax (application objects, function objects, etc.) for transferring semantical content. This may be necessary but is not sufficient.  The introduction should be improved by taking a simple example (switching lights on and off) and explaining how the semantics are described and how semantical differences of different existing systems can be resolved.	Improve the introduction by taking a simple example (switching lights on and off) and explaining how the semantics are described and how semantical differences of different existing systems can be resolved.	
6	165 - 185	Introduction	G	US-7	The purpose of this discussion is unclear. This section does not appear to be tied into the remainder of the doc.	Either add an explicit summary statement(s) that clarifies the intended “take-away” for this section or remove the section.	
6	186 - 200	Introduction	G	US-8	There are lots of terms that are not defined in the Section-3 that tends to hinder the reader’s understanding of the text. Examples include: “primitiveness of actions”, “action primitives”, “application action”, “action”.	Add these terms and their respective definitions to the Section-3.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
6	186 – 200	Introdu ction	E	DE- 04	<p>“This International Standard is based on understanding the difference in the primitiveness of actions at different levels of object definition (i.e., different levels of abstraction). Furthermore, it is based on separation of the concept of action primitives from the actual implementation of these primitives. For example, if objects (devices) in System-A use &lt;get&gt;/&lt;put&gt; functions to implement local or remote reading and writing of variable values, these are not considered “action primitives” in the context of this International Standard, but rather a programming mechanism used to invoke the application actions. The different actions are caused by &lt;put&gt;-ing (setting) the same variable to different values, which means that it is the variable and the value that it contains at a given time that define the application action. This is captured later on in this International Standard by eventing – objects (devices) notify each-other with the values of their parameters, and each device (object) makes its decisions and takes actions based on these values. During this processing each device may change these values; changes should be notified to all the interested parties. These <i>same actions</i> can be invoked in System-B by performing a (different) remote or local function call. In this case it is possible for both systems to implement the same lexicon, but with their own invocation mechanism.”</p> <p>This paragraph assumes an understanding of the subject that cannot be derived from the previous text.</p> <p>It also introduces terms like “actions”, “action primitives”, “eventing” etc. that are not sufficiently defined.</p>	<p>Rewrite the Introduction as an introduction to the subject (Taxonomy and Lexicon) explaining in detail the concepts and the terms in an organized, step by step fashion.</p> <p>Use a simple example (e.g. switching a light on and off) the reader of this document can easily relate to. This will help him understand the document without having been part of the group of authors.</p>	
6	201 – 207	Introdu ction	T	DE- 05	<p>“For example, one automation system might implement a shared variable space for communication between devices and components. In a simple lighting control example, a user might turn a wall switch on, causing a shared variable in the switch device on the network to change from 0 (off) to 1 (on). A lighting controller component in the system might be subscribed to that shared variable, causing the automation system to notify the lighting controller of the change in the variable’s state. The controller could then take actions as defined by the configuration and programming of the lighting control application.”</p> <p>This means that the Interoperability Taxonomy and Lexicon must be able to represent i.e. cover different system designs for transferring control information.</p> <p>The first step would be to list the different methodes for transmission of control information and find a superset that is capable of covering these different methodes. Such a superset is not provided in this document.</p>	<p>Provide a list or table with different methods for transmission of control information.</p> <p>Provide a superset of methods or aggregation of methods for transmission of control information.</p>	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
6	220 – 224	Introduction	T	SE 03	<p>“The interoperability model ..... provided by the components.”</p> <p>This seems to describe interoperability between manufacturers and developers rather than system components. Is this really what this International Standard addresses?</p>	Describe how the interoperability model in this IS addresses/applies to manufacturers and developers or delete the sentence.	
6	220 – 224	Introduction	E	CH1	<p>“The interoperability model in this International Standard addresses the requirements of two developer communities: the component developers (e.g., manufacturers), who develop individual devices and systems, and the solution developers (e.g., integrators or field installers), who provide one (or more) applications that use services provided by the components.”</p> <p>This statement is made without any background information or explanation. How does this standard serve these two communities? What does it provide to them?</p>	<p>Describe in detail how the taxonomy and lexicon serves the component manufacturers and the solution providers.</p> <p>Otherwise, remove this paragraph if it does not provide information relevant to describing the taxonomy and lexicon itself or how it is applied in practice.</p>	
6	223	Introduction	G	J01	Installers should be excluded from the readers of this standard.		
6f.	224 – 229	Introduction	E	DE-06	<p>“The two communities overlap at least partially. For example, a company that develops automation devices would typically provide software routines that link their products to specific application objects, which could be a standardized objects published as part of an application model, or could be something the company defined and published. In the latter case the object definitions are considered to be standard only upon publication in a registry of interoperable objects.”</p> <p>This statement appears to address proprietary extensions of definitions contained in this document.</p> <p>Taxonomy and lexicon for interoperability should be generic covering different systems.</p> <p>A registry may be needed for an implementation of an “interoperability domain”. Yet, this is not the subject of this document.</p>	Remove this text (lines 224 – 229).	
6f.	224 – 229	Introduction	E	SE 04	<p>“The two communities overlap ..... of interoperable objects.”</p> <p>This seems to address how vendors implement the specification. An International Standard is not concerned with how a vendor implement an International Standard as long as it fulfills the conformance requirements.</p>	Delete.	
7	228		G	US-9	What are the logistics related to the “registry”? Who owns/controls the registry’s contents? How is the registry found? How is the registry accessed/searched?	Clarify the logistics regarding the registry. If this information is not intended to be described within this spec, then state so explicitly and identify where/how those question will be addressed.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
8	261	1	G	J02	To see J01: Installers should be excluded from the readers of this standard..		
8	262	1	G	J03	To see J01 Installers should be excluded from the readers of this standard..		
8	271	1	E	J04	Is it mistaken "Part 3" for "Part 4"?		
8	256 – 259	1	T	DE-07	<p>"Single implementation home electronic system networks, connected devices and applications. Multiple implementation home electronic system networks, connected devices and applications."</p> <p>It is unclear what the difference is between "single" and "multiple".</p>	Provide examples that show the difference between these two bullet points.	
8	256 – 259	1	T	SE 05	<p>"Single implementation home electronic system networks, ..... Multiple implementation home electronic system networks ....."</p> <p>It is unclear what single and multiple stands for in this paragraph.</p>	Describe in welldefined terms the concept of these two sentences	
8	263 – 265	1	T	DE-08	<p>"This part of ISO/IEC 18012 addresses interoperability for system operation and management of products connected to a single home electronic system or to different home electronic systems."</p> <p>The introduction only discusses (run-time) operation not management (i.e. configuration). These are two completely different topics. System management is very system dependent and it is questionable that this can be done across systems with one solution. The document acknowledges this as it does not contain a clause or text specifically describing system management across different systems.</p>	<p>Limit the scope to what the document covers.</p> <p>Remove the text "and management".</p>	
8	263 – 265	1	T	DE-09	<p>"This part of ISO/IEC 18012 addresses interoperability for system operation and management of products connected to a single home electronic system or to different home electronic systems."</p> <p>There is only one "home electronic system" in a single dwelling as this term includes all electronic components and control systems in a dwelling.</p>	<p>Correct this text to</p> <p>"This part of ISO/IEC 18012 addresses interoperability for system operation of products connected to a home electronic system."</p>	
8	263 – 265	1	E	SE 06	<p>"This part of ISO/IEC 18012 addresses interoperability ..... or to different home electronic systems."</p> <p>Management of devices or network (= products) seems to be outside the area of this specification.</p> <p>And what does different home electronic systems mean?</p>	Delete 'and management' and 'or to different home electronic systems' .	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
8	271 – 272	1	T	SE 07	<p>"The full lexicon ..... the Application Model specifications."</p> <p>One would expect that the document entitled "Taxonomy and Lexicon" describes lexicon.</p>	<p>If the specification only partly describes lexicon (what ever that means (see comment 02) ), this should be understood from the title. Better would of course be to fully describe lexicon fully in this specification and delete any references to Part 3.</p>	
8	271 – 272	1	T	SE 08	<p>"The full lexicon ..... the Application Model specifications."</p> <p>This specification uses both the terms 'Application Model' and 'Application interoperability model' which makes the text very confusing.</p>	<p>Clarify the differences between 'Application Model' and 'Application interoperability model'. Should they really be described in different parts of the specification?</p>	
8	271 – 272	1	E	DE- 10	<p>"The full lexicon for the interoperability of home electronic systems will be defined in Part 3 of this standard, as part of the Application Model specifications."</p> <p>The title of this document is "Taxonomy and Lexicon". This signals to a user that the full Lexicon is defined in this part.</p>	<p>The full Lexicon shall be defined in this part of the standard.</p> <p>Remove the referral to part 3.</p>	
8	271 – 272	1	E	DE- 11	<p>"The full lexicon for the interoperability of home electronic systems will be defined in Part 3 of this standard, as part of the Application Model specifications."</p> <p>What is the difference between the "Application Model" supposed to be defined in a part 3 and the "application interoperability model" as covered in clauses 4.2 and 5?</p> <p>The standard title is "Guidelines for product interoperability". Any application model description in any part of this standard must be consistent. If the application model is part of the taxonomy then it shall be described in this part 2of the standard only.</p>	<p>If the "application model" is part of the taxonomy then it shall be described in this part 2 only.</p> <p>If it is not part of the taxonomy then remove any descriptions of the "application model" from this document.</p>	
9	281	1	T/G	J05	<p>Relationship between Fig. 1 and Fig. 2 is not clear.</p>		
9	281	1	T	Ca 3	<p>The text in lines 282 – 286 is self-explanatory without Figure 1. Figure 1 does not provide more information and is confusing as Figure 2 is close but different.</p>	<p>Remove Figure 1 and the corresponding text.</p>	
9	281	1	E	J06	<p>The Figure 1 should be showed as an example.</p>	<p>Figure 1 – Example of two interoperating networks</p>	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
9	300	3.2	T	Fr03	API definition could be improved	Replace with : “An <b>application programming interface</b> (API) is a source code interface that a computer system or program library provides to support requests for services to be made of it by a computer program.” Or ‘A piece of software specifies the way other pieces of software can interact with it, either through direct calls or a remote invocation protocol. It may be described in an IDL (Interaction Definition Language) or a programming language.”	
9	304	3.3	T	Fr04	The definition of “co-existence” is not good.	Replace with “Possibility for several networks to be used without interfering one each others.”	
9	282 – 286	1	T	DE-12	“This International Standard applies to application objects in operation within networks, between networks, and to components located at the junction of dissimilar networks. Two (or more) dissimilar networks (referring to Figure 1 as an example) that conform to this International Standard, when linked by some communication system, are expected to behave as if both networks were logically the same network from an application perspective.”  This text does not describe the scope of the document. Remove this text from the Scope.  A similar description is provided in the Introduction.	Remove this text and Figure 1 from the Scope.	
10	297		G	US-5	Several terms are missing e.g. “Application Model Framework”, “action primitives”,	Ensure that all nouns (specific to this document) are included in Section-3 “Term, Definitions, and Abbreviations”.	
10	316	3.5	T	Fi 3	Such definition is overly restrictive. For instance, it precludes multiple independent software applications running on a PC that provide multiple services.	Change to “physical or logical unit on a network”.	
10	323	3.6	E	J08	“Event bus (communication bus)” should be added.		
10	324	3.7	T	Fr05	Definition not understood, hence not translatable.	Improve dramatically	
10	331	3.9	E	J07	“Functional object” should be added.		

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
10	331 - 336	3.9	E	CH2	<b>“intermediate implementation”</b> This term is not used in the document.	Remove this term from the definitions.	
10	339	3.10	T	Fr06	Interoperability : (1) is false.	Replace (1) with “the ability of logical entities to function together for applications on a network”	
10	346	3.11	E	J09	Interoperability domain looks like a dictionary or a lookup table of two languages.	To add an explanation such as dictionary of two application domains.	
10	347 - 350	3.12	T	DE-13	<b>“interoperability domain interface (IDI)”</b> software object that provides the translation between a generic interoperable object instance and a corresponding system-specific counterpart by using an interworking function”  The “interworking function” actually is a gateway function, which is already described by the text “software object that provides the translation between a generic interoperable object instance and a corresponding system-specific counterpart”.  The IDI is the access point (API?) for the gateway function.	Remove the text “by using an interworking function”.	
11	357	3.14	T	J10	It should be clear the relationship between IWF and IDI.		
11	365	3.16	T	Fr07	The definition of a network is false. This is much more a definition of a sub-network. A LAN has often the backbone in optical, and drop in copper. It's not the same physical layer.	Delete “that share a single physical layer”	
11	375	3.19	E	Fr08	Typo	Abbreviations	
11	376	3.19	E	Ca 4	“API application programming interface” The abbreviation API is used only in definition 3.2. Remove this abbreviation.	Remove the abbreviation “API”.	
11	377	3.19	E	DE-14	“GL gateway link” GL is only used once in the document. The term gateway link was replaced by the term “interoperability domain”.	Remove the abbreviation “GL”. Replace “GL” in the document by the term “interoperability domain”.	
11	380	3.19	E	DE-15	“HGI home gateway interface” The abbreviation HGI is only used in Figure 1. The term “home gateway interface” was replaced by the term “interoperability domain interface”.	Remove HGI from this list of Abbreviations as it is only used in Figure 1 where it shall be replaced.	
11	385	4.1	E	Fr09	Most of 4.1 should be in “INTRODUCTION”		

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
11	395	4.1	E	CH3	The term "binding" is used multiple times in the document but is not defined anywhere.	Add a definition for binding in clause 3, Definitions.	
11f.	385 – 407	4.1	E	DK 03	The text explains what is not part of the scope	Move the description to clause 1, Scope.	
11f.	385 – 407	4.1	E	CH4	Clause 4.1 Management contains text that actually does not specify conformance requirements but states that Management is not part of the scope.	Move this whole clause to clause 1, Scope.	
11f.	385 – 407	4.1	E	SE 09	Clause 4.1 states that Management is not part of the scope.	Move this whole clause to clause 1, Scope.	
12	439 - 442	4.11	T	DE- 22	<p><b>“Application binding map schema</b></p> <p>An implementation shall support a binding map mechanism that conforms to the requirements defined in Clause 9, such that any interoperable application may be fully specified to the interoperability framework implementation.”</p> <p>What is the purpose of this requirement?</p> <p>The binding map is only valid within the Interoperability Domain (ID).</p> <p>Any necessary communication connections outside of the ID have to be configured separately and cannot be part of the binding map.</p>	This requirement needs more explanation.	
12	407	4.1	G	J11	To see J01: Installers should be excluded from the readers of this standard..		
12	411 – 413	4.3	T	DE- 16	<p><b>“Software logic encapsulation</b></p> <p>An implementation shall support encapsulating software logic within application objects, as described in 6.2.”</p> <p>What is the advantage of this requirement?</p> <p>If message exchange is done via objects then it is completely irrelevant how these objects are manipulated for sending information or processing information received.</p> <p>This is just an implementation detail that doesn't affect interoperability.</p>	Remove this requirement.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
12	411 – 442	4.3 – 4.11	T	SE 10	Several of these requirements are questionable. For interoperability within a Home electronic system (HES) we cannot see the reason for them. As an example we take : “Event timestamps An implementation shall support event timestamps as described in 6.4.” It is an additional burden to require that ALL events from application objects must contain time stamps.	Remove most requirements and in particular the one on time stamps.	
12	414 – 416	4.4	T	DE- 17	“ <b>Interaction with interworking functions (IWFs)</b> An implementation shall support interaction between IWFs and application objects, as described in 6.2.” This requirement disregards the fact that a gateway function is only needed on the edges of the Interoperability Domain i.e. in Interoperability Domain Interfaces.	Only require IDI's to implement the gateway function(s).	
12	417 – 419	4.5	T	DE- 18	“ <b>Multiple bindings for application object event inputs and outputs</b> An implementation shall support the definition of multiple bindings per application object event input or output, as described in 6.3.” Do all application objects that are part of a binding map receive a notification at the same time (multicast event message propagation)?	Clarify binding and communication method.	
12	423 – 424	4.7 – 4.11	T	DK 04	Event Timestamps There is no reason to enforce the support of timestamps on events in a Home electronic system (HES) environment.	Delete this requirement.	
12	423 – 424	4.7	T	Fi 4	The event timestamping is hard and expensive to properly implement and is not needed in many applications in practice.	Change the requirement of the event time stamps optional.	
12	423 – 424	4.7	T	DE- 19	“ <b>Event timestamps</b> An implementation shall support event timestamps as described in 6.4.” The necessity of event time stamps for interoperability has not been proven in clause 6.4. Practical systems in operation do not employ event time stamping. Time stamping is only used for capturing information in database systems or building management systems as part of professional facility management. Time stamping does not improve interoperability between parts of a home electronic system.	Remove this requirement.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
12	425 – 428	4.9	T	DK 05	Temporal association of events What is the purpose of this temporal association? The request "at the same time" seem to imply multicasting, which is hard to perform through routers. Is this really necessary in a Home electronic system (HES) environment?	Delete this requirement.	
12	425 – 428	4.9	T	DE- 20	<b>“Temporal association of events</b> An implementation shall support the requirement for multiple events generated concurrently from a single application object to be delivered at the same time to any application object that has a binding to two or more of those concurrent events, as described in 6.4.” What is the purpose of this temporal association? If the request is "at the same time" then this requires multicasting. Apart from the fact that not all networks support multicasting this is even challenging for IP-based systems as multicasting is not easily propagated across network routers.	Remove this requirement.	
12	432 – 438	4.10	T	DE- 21	<b>“Object schema”</b> The format of the data (schema) should be defined together with the data delivery protocol. Schemas do not belong to the taxonomy or lexicon and hence do not belong to this document.	Remove this requirement.	
12	439 - 442	4.11	T	DE- 23	<b>“Application binding map schema</b> An implementation shall support a binding map mechanism that conforms to the requirements defined in Clause 9, such that any interoperable application may be fully specified to the interoperability framework implementation.” Clause 9 does not define specific requirements that can be implemented.	Remove this clause 4.11.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
12 – 14	443 – 490	5	T/E	DE- 26	<p>Clause 5 is titled “Application interoperability model”.</p> <p>The current text is not easily understood as it does not follow a consistent, step-by-step approach explaining the parts and pieces of the model and building it from the ground up.</p> <p>Figure 2 does not help in understanding the model.</p> <p>Clause 5 and figure 2 do not explain where the application interoperability model is applicable.</p> <p>Clause 5 should be rewritten to build the actual model from the ground up. The functions are the starting point. They define the purpose of devices. Functions may be classified into sensor, actuator or control functions. A device is a physical entity that provides / contains specific functions.</p> <p>Sensor functions process binary or analog physical input signals and share the result of that processing via objects with other functions.</p> <p>Actuator functions process information received via their objects from other functions and set binary or analog physical output signals.</p> <p>Control functions process information received via their objects from other functions and share the result of that processing via objects with other functions.</p> <p>Functions consist of a "private" part, i.e. the actual processing algorithm, and of a "public" part, i.e. the objects and parameters. In this sense, functions are represented by their objects and parameters. Changes to the objects and parameters determine the behavior of a function. Typically, a parameter is fixed during run-time operation and may be changed during the commissioning or setup phase.</p> <p>Functions exchange information via their objects using an event-driven, data-based information exchange mechanism. Because of its event-driven nature it is called the event bus.</p> <p>The combination of functions constitutes an application, i.e functions are the building blocks of applications.</p>	Rewrite Clause 5.	
12	444 – 445	5	T	DE- 24	<p>“The application interoperability model is based on the definition of one or more application domains, where each domain is identified explicitly in the HES object taxonomy.”</p> <p>It is unclear what the purpose of the application domain is.</p> <p>This approach attempts to describe the application interoperability model with a top-down approach instead of a bottom-up approach.</p>	Describe what the purpose of the application domain is and why it is needed.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
12	445 – 446	5	T	DE-25	“Each domain is populated with application objects representing sensor, actuator and control <b>devices</b> .” Are these truly devices? Aren't these really functions?	Replace “devices” by “functions”.	
13	451		G	US-10	The text states “...instance collects sensor information....” How is the information “collected”? Does it actively invoke pre-defined actions to retrieve the sensor data or does it passively wait for sensor data to be events to be captured?	Add a brief sentence or two clarifying the interaction model with the sensor. If the interaction model is described elsewhere in this spec add a reference to that section in the spec.	
13	464		G	US-13	In order to achieve interoperability between various “components” that are built/delivered by different manufacturers (e.g. devices, IWFs, interoperability objects, etc.) there needs to be a well known “process” getting these components configured correctly. If that configuration process is not defined in this spec, where will it get defined?	Clarify where the configuration process will be defined.	
13	462 – 466	5	E	DK 06	The text explains what is not part of the scope	Move this description to clause 1, Scope.	
13	462 – 466	5	E	SE 11	“The association of interoperable application objects ..... via the IWFs.” This concerns the scope of the document.	Move this description to the scope.	
13	467			US-3	Figure-2 does not show the entity that sets up the binding map. This key component is essential to achieving the application functionality and should be clearly incorporated in to the overall interoperability model.	Update Figure-2 and the related text to show how this “setup” entity fits into the overall interoperability model. Specifically, the diagram/text should describe where the object description data structure is retrieved.	
14	467		E	US-2	Figure-2 does not show the binding map. This is a key component for achieving desired application functionality.	Figure-2 needs to be updated to show how the binding map fits into the overall interoperability model.	
14	488		G	US-12	This sentence implies that network system determines which IWF to use for each physical device. This implies that the device manufacturer, application developer, nor the home owner can specify which IWF to use for a given physical device. The current mechanism enables a single-point of attack in which malicious software can hijack the system with its own “unfriendly” IWFs.	Eliminate this ‘single-point of attack’ by clarifying how the IWF is selected and provide mechanisms for the device manufacturer, application developer, or home owner to control which IWF to use for each device (if desired). Also, the “order of precedence” needs to be defined.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
14	491	6	T/E	DE-29	The taxonomy has to be covered before the interaction model. First the structure has to be presented before a description of the interactions between structural elements can be understood. Switch clauses 6 (Interaction Model) and 7 (Home electronic system application interoperability taxonomy).	Switch clauses 6 (Interaction Model) and 7 (Home electronic system application interoperability taxonomy).	
14	491	6	E	SE 12	It is not logical to describe the interaction model before the taxonomy.	Change the order of clauses 6 and 7	
14	493		G	US-13	The terminology in the text does not seem to match the labelling in Figure-2.	Make the terminology of the text match the labelling of the diagrams.	
14	485 – 487	5	T	DE-27	“The interoperability domain is a logical entity. It can be implemented on a single physical device/platform, distributed over several devices, or its functionality may be integrated with other functional entities such as a HES Gateway.”  The Interoperability Domain is indeed a meta-system connecting different networks or proprietary systems or "application clusters" with each other. In that sense it acts as a middleware between these different systems.  It may be using the same IP network to exchange data within the Interoperability Domain. Despite sharing e.g. the same physical network it is logically separated. This logical view is more important than where the Interoperability Domain implementation may physically reside.	Modify the text to reflect that the Interoperability Domain is a logical entity that may share the physical network with proprietary systems or “application clusters”.	
14	488 – 490	5	T	DE-28	“Specific network systems shall specify the IWFs to be used for the interoperable object instantiation and running on an interoperability domain for devices that are intended to be interoperable.”  This paragraph assumes that an IWF (better: Gateway Function) needs to be generically defined.  This is not the case as hundreds of gateway implementations between different network or proprietary systems or "application clusters" have proven.  The IDI's in figure 2 actually are gateways. Any communication from these into the Interoperability Domain is part of that domain.	Remove this text.  The specific function of a gateway is not a subject of this standard.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
14	499 - 529	6.1	T	Fi 6	This section first says “individual function parameters of an application are being passed across the event bus as separate events”, then “automated aggregations of multiple concurrent events” is used to group together events to improve efficiency, which requires that at the destinations, “the grouping should be disaggregated into their individual events”. All these segregations, aggregations and disaggregation seem to add a lot of overhead. Is the saving in transmission efficiency large enough to justify the complexity?		
14	499 - 501	6.1	T	DE-30	“Each application object can have multiple event inputs and event outputs, which correspond to the input and output parameters (as defined in IEC 60050-714:1992, Definition 714-21-08) of that application object’s function or functions..”  How does an event input correspond to the input parameters of that (!) application object's function?  Is there a simpler way of putting this?  This sentence may want to express this:  Functions exchange information via their objects using an event-driven, data-based information exchange mechanism. Because of its event-driven nature it is called the event bus.	Provide a more in-depth description of the eventing concept.	
14	501 - 502	6.1	T	CH5	“Therefore, the individual function parameters of an application object are being passed across the event bus as separate events.”  What is an "individual function parameter of an application object"?	Describe what an "individual function parameter of an application object" is.	
14	509 - 513	6.1	T	DE-31	“Event destinations are specified by a binding map that is part of the application interoperability framework definition. The binding map is used to define event connections (bindings) between application objects at the individual event level. These bindings are simply the declaration of a connection from an event output of an application object to one or more event inputs of an application object or objects.”  How is the binding map generated and where it is stored?  Why is a binding map necessary?	Provide answers to these questions: Why is a binding map necessary? How is the binding map generated and where it is stored?	
14	515 - 529	6.1	E	SE 13	“Therefore, it is expected that ..... concurrent events.”  'It is expected that' is a very unconventional text in an IS specification	Delete or modify the text.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
14	515 – 529	6.1	T	DE-32	<p>“Therefore, it is expected that implementations of this International Standard will make use of both the application object schemas and the binding map information to enable efficient automated aggregations of multiple concurrent events.”</p> <p>Does “expected” mean “may”, “should”, “shall”?</p> <p>The following text in the paragraph suggests that this whole paragraph is a comment or note.</p> <p>“This means that during execution implementations should group together concurrent events (e.g., event outputs that were generated concurrently by an application object) that have the same destination, and move them across the event bus as a single communication transaction (e.g., a single message payload, a single memory transfer, etc.). See 6.5: Event bus for a further discussion of this concept. [...]”</p> <p>The implementation details of the event bus are not provided in this document and do not belong into Taxonomy and Lexicon. The language suggests that an event bus may be implemented without grouping events into one transmission frame.</p>	Either remove this text or change to a note.	
14	518	6.1	T	Fi 5	<p>“multiple concurrent events”</p> <p>How are “concurrent events” defined? Are they events that are concurrently generated by a single operation, or are they events that are generated by the application object at the exact same moment in time?</p>	Clarify meaning of “multiple concurrent events”.	
14	518		G	US-14	<p>When event messages are aggregated, it seems that “how they are aggregated” needs to be standardized so that the receiver necessarily knows how to “disaggregate” the messages. This uniformity is needed for interoperability.</p>	Either define how event messages are aggregated or identify where the aggregation rules will be described.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
15	539 – 545	6.2	T	DE-33	<p>“Application objects encapsulate software logic appropriate to the component they represent in the system. For example, a temperature sensor application object for a temperature sensor device would receive temperature readings from the device via an IDI using an appropriate IWF that performs any necessary reformatting or translation on the readings to put them in the form of the interoperable properties defined in 7.4.2: Application object. The temperature sensor application object can then perform any additional application processing desired (if any) before generating an output event on the event bus containing the temperature reading.”</p> <p>How does the information in this paragraph relate to the application interoperability model?</p> <p>The software mentioned implements a desired application function but it’s inner workings are private (encapsulated) and thus not of importance to the application interoperability model.</p> <p>This supports the comment on Clause 8.1, lines 750 to 754, and request for removal of lines 750 to 754.</p>	<p>Clarify how the information in this paragraph relates to the application interoperability model.</p> <p>If there is no immediate relationship discard this text.</p>	
15	546 – 561	6.3	T	DE-35	<p>This clause assumes that bindings are permanently set.</p> <p>This excludes that two application objects may be connected for a limited time to provide a function. An example is a DVD player that is discovered and then connected to TV set, which displays the movie from the DVD on its screen.</p>	<p>Clarify if only permanently set bindings are covered by this standard.</p>	
15	547	6.3	T	DE-34	<p>“A binding map corresponds to a single application in the interoperability domain.”</p> <p>What defines a single application?</p> <p>Why does a binding map correspond to a single application only? How are actions that apply to all devices modeled?</p>	<p>Provide answers to these questions:</p> <p>What defines a single application?</p> <p>Why does a binding map correspond to a single application only? How are actions modeled that apply to all devices?</p>	
15	559	6.3	T	J12	<p><b>Binding map</b> should be described on each home network specification as a part of proposal standard document. The reason of this proposal is to establish of interoperability mechanism.</p>	<p>Binding map shall be described on each home network specification.</p>	
15	565 – 571	6.4	T	DK 07	<p>Events see comment DK 04</p>	<p>Delete the text dealing with time stamps.</p>	
15	565 – 571	6.4	T	SE 14	<p>“Events shall .... a temperature sensor reading occurred).”</p> <p>It is an extra burden to force time stamps to be mandatory.</p>	<p>Delete.</p>	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
15	565 – 566	6.4	T	DE-36	<p>“Events shall also contain a timestamp, as defined by the application object schema.”</p> <p>What is the purpose of the time stamp? How does a time stamp improve interoperability?</p> <p>Typical systems in the market do not require a time stamp for control of e.g. lighting, HVAC, or A/V. Devices receiving a message are expected to react immediately upon receiving the information. A time stamp does not provide any performance improvement but rather is a burden.</p> <p>Typically a time stamp is used for capturing events in a database for analytical purposes. The time stamp is generated by the device capturing the data.</p> <p>Assuming that all devices in the interoperability domain are on the same network (this is inside the home!) then a time stamp does not provide an advantage. An event-driven system has so little traffic on the network that any device practically has immediate access to the network. Hence, a time stamp does not improve performance.</p> <p>Communication to entities outside of the home is out of scope for HES.</p>	Remove this sentence.	
15	567 – 571	6.4	T	DE-37	<p>“At a minimum, there should be a timestamp that corresponds to the time at which an event is placed on the event bus by an application object. In addition, depending on the capabilities of the underlying system implementation, there could be a second timestamp that represents the time when a physical event actually occurred (e.g., the time that a temperature sensor reading occurred).”</p> <p>Time stamping does not provide performance or interoperability improvements on a control network with typical reaction times of less than 100ms.</p>	Remove this paragraph.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
16	576 ff	6.5	T	Ca 5	<p>“The intent is that the event bus model be as simple as possible, allowing it to be implemented on the broadest possible set of underlying communication mechanisms. One implementation might be based on a shared memory for an interoperability domain that is completely contained in a single processing device such as a simple embedded gateway. A more comprehensive implementation could be a distributed event bus on top of a publish/subscribe transport spanning multiple processing devices (such as a collection of HES-Links or GLs, connected over a network), or any combination of such implementations – the event bus does not have to be implemented on a uniform underlying communication mechanism, and in fact is likely to span multiple underlying communication mechanisms as part of building an interoperable HES.”</p> <p>This text implies that the event bus is a concept that may be implemented or represented by different control systems.</p>	<p>Describe the event bus concept.</p> <p>If it helps understanding the event bus concept, provide implementation examples as notes.</p>	
16	586 – 588	6.5	T	DE- 38	<p>“An important characteristic of the event bus is that multiple events generated at the same time from a single application object must be delivered at the same time to any application object that has a binding to two or more of those concurrent events.”</p> <p>If the events have to be delivered at the same time, why separate them in the first place? What is the purpose and advantage of these segregations (of individual function parameters into individual events), aggregations (of multiple concurrent events) and disaggregations (at the destination)?</p> <p>This generates unnecessary complexity and may be the reason for requesting time stamping.</p>	<p>Keep the event bus system simple.</p> <p>Aggregate events that result from a single operation on a single application object and send the event to all interested recipients.</p>	
15	587		G	US- 16	<p>The “must” seems to contradict the “should” in Line 519.</p>	<p>Decide if this is a “must” or “should” and make the text consistent. Also, “must” needs to be replaced with “shall” throughout the spec.</p>	
16	594	6.5	T	J13	<p>In practical problems, to describe general or universal “Event bus” is not simple works. There are many “Event bus” between home network specifications, <math>n(n-1)/2</math>.</p>		
15	595		G	US- 15	<p>Figure-4 does not easily map into Figure-2 without some assumptions by the reader. Similar comment for Figure-3 and Figure-2</p>	<p>Clarify how Figure-4 fits into Figure-2. Similar comment for Figure-3 and Figure-2.</p>	
17	609	7.1	T	Fi 7	<p>How do the entities being depicted in this diagram relate to Fig. 2?</p>	<p>Clarify relationship between these entities and the framework depicted in Fig. 2. For example, which entity does “Interoperability Object 1” in Fig. 2 map to?</p>	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
17	609	7.1	T	J14	Relationship between Fig. 5 and Fig. 2 is not clear.		
17	610	7.1	T	J15	Relationship between “Interoperability Domain” and “Application Domain” is not clear.		
18	610		G	US-17	The terminology in Figure-5 and the following text doesn’t seem to exactly match the terminology in the earlier sections e.g. no “interoperability object” is listed.	Use consistent terminology throughout the spec. There should be one and only one term for each component.	
17	625 – 627	7.1	T/E	DE-39	<p>“Objects, in general, represent the semantics of the application, i.e. they represent behaviour, which is exhibited through the interaction with other objects by invoking primitive actions on the properties.”</p> <p>What type of objects are meant here: Functional objects, Application objects, other?</p> <p>Semantics is defined as the meaning of data or code in a specific context.</p> <p>In general, objects have a public interface and a private function. The interface provides the means to connect different objects with each other, thus establishing a basis for a desired function. When data is exchanged between objects the meaning of that data is derived from the context it is used in, i.e. the semantics. Example: The same binary value “1” may mean “on”, “up”, “start” etc. depending on the context it is used in.</p>	<p>Provide a precise description of the application interoperability taxonomy with a bottom-up approach from the smallest entity to the largest aggregation.</p> <p>Define terms and use these terms consistently.</p>	
17	625 – 627	7.1	E	SE 15	<p>“Objects, in general, ..... on the properties.”</p> <p>The expression ‘represent the semantics’ seems incorrect.</p>	Replace ‘represent’ by ‘implement’.	
17	627	7.1	E	SE 16	<p>“The use of both Functional Objects and Operational Objects allows the [...]”</p> <p>It is not clear what these terms stands for.</p>	Describe and define the terms ‘Functional Objects’ and ‘Operational Objects’.	
18	648 – 652	7.2.2	T	DE-40	<p>Application domain list:</p> <p>Why is an enumerated list of application domains needed for the taxonomy and lexicon?</p>	Explain why an enumerated list of application domains is required for taxonomy and lexicon.	
18	649 – 650	7.2.2	G	Fi 8	Who owns and maintains this application domain list?	Clarify ownership.	
19	689	7.3.4	G	Fi 9	Who owns and maintains the functional object list?	Clarify ownership.	
20	726 – 727	7.4.5	G	Fi 10	This statement does not give sufficient description on how the derived data units will be listed and maintained. (“in the same way the lexicon registry is maintained” is not sufficiently descriptive.)	State explicitly how the derived data units will be listed and maintained.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
21	728	7.4.5 Table 3	T	Fr10	Instead of speaking of luminous intensity, it might be better to use the luminance, for which the unit is the Lux.	Replace "Luminous intensity" with "Luminance", and "Candela" with "Lux"	
21	735	7.4.6	T	J16	There is no description for the multicast.	Add multicast description.	
21	750 - 754	8.1	T	DE-41	<p>"The object schema must also reference the executable logic that implements the object's functions. This reference is implementation-independent, and needs to be able to support any execution platform and language. The purpose is to enable an interoperability framework implementation to invoke any executable logic for an object, and present the input events that are pending (i.e., that have arrived for the object from the event bus)."</p> <p>There are systems (e.g. KNX, UPnP) that do not invoke code on a device but still provide interworking between devices.</p> <p>Why is it necessary for interoperation to be able to invoke the execution of logic for an object?</p> <p>The concept of invoking executable code is introduced in this clause. As this appears to be part of the application interoperability model it should be described in clause 6.</p>	<p>Describe what the purpose and role of the executable logic is within the application interoperability model.</p> <p>Explain why existing systems do not need this but the application interoperability model does.</p> <p>Add both to clause 6.</p> <p>Remove the text in lines 750 – 754.</p>	
21	751 - 752	8.1	T	Fi 11	The text maintains that the schema "needs to be able to support any execution platform and language". However, in the schema definition (B.3), only "C++", "JAVA" and "XSL" are listed? Does this list of three items really achieve that goal?		
23	819 - 820	8.2.2	G	Fi 12	<p>"Both the QoIRequirement and the QoI metadata are open-ended sets of information, and will be expanded as needed to support different application requirements."</p> <p>Expanded by whom? The standards committee or the vendor?</p>	Clarify the scope of expansion intended by this proposed standard.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
23	821 – 845	8.2.2	T	DE-42	<p>“The codeBase section of the schema is:[...] such that the <b>interoperability framework runtime system</b> can <b>invoke the executable software</b>.[...]”</p> <p>This would typically be used to provide additional details required by the implementation to support language binding mismatches.”</p> <p>This document describes interoperability between independent devices and clusters of devices. What is the “interoperability framework runtime system” and what is it required for?</p> <p>Why is a codeBase required?</p> <p>What software is invoked?</p> <p>The interoperability model as described earlier in the document requires that an object that receives input events would autonomously decide what to do with the input events and possibly generate output events. Why then would there be a need to invoke software on this object? And who (what entity) is invoking that software?</p>	Remove this text as the need for a “codeBase” or “interoperability framework runtime system” is not justified in the document and does not appear to be a consistent part of the application interoperability taxonomy.	
23	846	8.2.2	T	Fi 13	The definition mandates “one or more property elements”. Why isn't an object allowed to have no properties at all?	Change to “zero or more property elements”.	
24	857	8.2.3	T	J18	Name of “Sensor object “ is not suitable. Some sensors have inputs.	Change the name. →Object without inputs	
24	858	8.2.3	T	Fi 14	If sensor objects only provide outputs, why does it need a codebase element?	Remove “codebase”.	
24	861	8.2.4	T	J19	Name of “Actuator object “ is not suitable. Some actuators have outputs.	Change the name. →Object without outputs	
24f.	884 – 920	9 and 9.1	E	DE-44	Clause 9 only contains one sub-clause titled “Overview”.	Remove the sub-title “9.1 Overview”.	
24f.	886 – 889	9.1	T	DE-45	<p>“The binding map defines the event input/output connections between the sensor, actuator, and control object input and output events of an application. “</p> <p>This is a definition and should be moved to clause 3.</p> <p>” A binding between two application objects will name the two objects involved, and also the specific input and output events that are being connected.”</p> <p>Does this phrase define the term “binding”? Then it should be moved to clause 3.</p> <p>In conjunction with previous comments Clause 9 does not contain requirements. Hence, clause 4.11 is not pointing to requirements.</p>	<p>Remove clause 4.11.</p> <p>Consider merging lines 886 to 889 into clause 6.3.</p> <p>Consider definitions for “binding” and “binding map” in clause 3 based on this text in lines 886 to 889.</p> <p>Remove clause 9.</p>	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
24f.	890 – 920	9.1	T/E	DE-43	The example and the following text are descriptive and provide a reasoning for having an event bus and using a binding map.  This description belongs to the Introduction.	Remove the text in lines 890 to 920 from clause 9.  Consider using the text in the Introduction.	
27	927	Annex B	T	J20	This standard is guidelines for product interoperability. Therefore, annex B should be “informative”	“Normative” should be changed to “Informative”.	
27ff.	930 – 162 4	Annex B	T	DE-46	This part 2 of the standard is named “Taxonomy and Lexicon”. If this schema represents a lexicon then it should be possible to describe other systems with this schema.  How does this schema support the description of taxonomy and lexicon?	Remove the schema if it does not provide the means to describe existing systems.	
35	150 9	B.5	T	J21	Input is deleted.	Delete line 1509	
36	153 6	B.6	T	J22	Output is deleted.	Delete line 1536	
38	163 0	Annex C.1	G	J23	Unit type is not sufficient.	Add below. Angle degree Velocity m/sec Power Wh Concentration ppm Ratio %	
38	163 5 - 163 6	Annex C	T	DE-47	“The purpose of this document is to define the derived data types of iDACS XML Schema”  What is the iDACS XML Schema?  What does iDACS mean?  Is this XML Schema listed in Annex C and Annex B a company specific schema placed here?	Remove any company specific XML schemas from this standard document.	
42	188 9 – 192 2	Annex D	E	DE-48	Annex D contains explanatory text expected in the introduction.	Consider moving some content of Annex D to the introduction.	
42	190 4	D.2	G	Fi 15	Shouldn’t the taxonomy definitions be the key to this document (Taxonomy and lexicon)? Why is this clause here in an informative annex and not part of Clause 7?	Move to clause 7.	
42	190 9	D.2	G	Fi 16	“Device Profile” is not mentioned anywhere else (such as Clause 7) and is only used here and in the subsequent table. How relevant is it to the taxonomy?	Either include “Device Profile” in other parts of the document as relevant, or remove it altogether.	

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Resolution
42	191 5	D.3	G	Fi 17	How about a mapping for ISO/IEC 29341 (UPnP)?	Add mapping for UPnP.	
42	191 5	Annex D.3	G	JP24	Change the table	Delete CEBus because of the obsolescence. Add ISO/IEC 14543-4 (ECHONET) below. Property item →Property Object item → Object Functional Class item →Class Group Application Model item → Application Service Device Profile item → Class	