

# hData Record Format v0.11

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## 1 Introduction

The hData Record Format (HRF) describes the XML representation of the information in an electronic health record (EHR). The HRF is implemented through a component-specific documents that are linked and organized through a “master document”. For better organization, the individual documents are put into a hierarchy, with the master document at the root of this hierarchy. While the HRF defines a core set of components, it is fully extensible and can easily be adopted for more complex situations.

This specification only describes the organization of data within an abstract hData Record (HDR). Another specification describes how a HDR is serialized [1].

### 1.1 Namespaces

This document uses the following namespaces. This specification uses a number of namespace prefixes throughout; they are listed in Table 1. Note that the choice of any namespace prefix is arbitrary and not semantically significant.

Namespace Prefix	Namespace URI	Description
hrf	<a href="http://projecthdata.org/hdata/schemas/2009/06/core">http://projecthdata.org/hdata/schemas/2009/06/core</a>	Namespace for elements in this document
hcp	<a href="http://projecthdata.org/hdata/schemas/2010/04/hcp">http://projecthdata.org/hdata/schemas/2010/04/hcp</a>	Namespace for hData Content Profile Description language
hrf-md	<a href="http://projecthdata.org/hdata/schemas/2009/11/metaadata">http://projecthdata.org/hdata/schemas/2009/11/metaadata</a>	Namespace for meta data
xs	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>	XML Schema namespace
ds	<a href="http://www.w3.org/2000/09/xmlsig#">http://www.w3.org/2000/09/xmlsig#</a>	Namespace for XML Digital Signature

atom	http://www.w3.org/2005/Atom	Namespace for the Atom syndication format
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21 **1.2 Glossary (Non-Normative)**

22 **hData Record Format (HRF)** - The part of the hData specification that defines the abstract hierarchy, meta-data  
 23 schema, and document organization of the hData record.

24 **hData Record (HDR)** - an single instantiation of the HRF.

25 **hData Restful API (HRA)** - the part of the hData specification that defines the basic HTTP-based API for  
 26 accessing or modifying an HDR.

27 **hData Specification** - a set of normative specifications that defines the HRF, the HRA, and a file-based  
 28 serialization format.

29 **hData Content Profile (HCP)** - a profile of the medical content of an HDR. An HCP is specified separately from  
 30 the HRF.

31 **Electronic Medical Record (EMR)** - the medical record or records of a single patient in the IT system of an actor  
 32 (health provider, government entity, payer, etc.). In this definition, an HDR is a type of EMR.

33 **Electronic Health Record (EHR)** - the collection of all EMRs of a single patient, across organizational and  
 34 national boundaries.

35 **EHR System** - An IT system that creates, stores, and manages EMRs.

36 **Clinical Document Architecture (CDA)** - an XML specification by Health Layer 7 International (HL7) that is  
 37 intended to be used for EMRs.

38 **Continuity of Care Record (CCR)** - a specification by ASTM that is intended to be used for summary/continuity  
 39 of care documentation. A CCM is a type of EMR.

40 **Continuity of Care Document (CCD)** - a profile of the CDA that accommodates the medical information of the  
 41 CCR.

42 **1.3 Notational Conventions**

43 The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT",  
 44 "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#).

45 When describing concrete XML schemas, this specification uses the following notation: each member of an  
 46 element's [children] or [attributes] property is described using an XPath-like notation (e.g.,  
 47 /x:MyHeader/x:SomeProperty/@value1). The use of {any} indicates the presence of an element wildcard. The  
 48 use of @{any} indicates the presence of an attribute wildcard.

49

50 Note also that only the W3C XML schemas linked in Appendix A at the end of this document are normative –  
 51 any schema fragment or other schema description is informational only.

## 2 Hierarchical Organization

The basic approach of the hData Record Format is to represent the medical data through linked documents, which are organized through an abstract hierarchy. The hData storage and network protocols map this abstract hierarchy to a concrete implementation, such as a directory folder or web resource hierarchy.

In order to be able to accommodate more complex situations, HRF was designed with a number of extension points that allow the definition and insertion of new components. Extension can be optional, i.e. a parser that is not capable of processing the data in the extension may safely ignore it. If an extension is marked mandatory and the parser has no support for it, the parser MUST notify the user or raise an exception.

### 2.1 Overall Structure

At the root of the hierarchy is the root document (RD). The actual information is contained in component specific sections, some of which are REQUIRED. The component specific sections are the primary extension points within the hierarchy. Implementers can either extend existing component sections or define new sections. Such newly created sections MUST be registered in the RD to be accessible.

Each section corresponds to a single set of documents. Documents are grouped into sections by type. For instance, a section may contain laboratory result documents.

### 2.2 Root Document

The root document is as the root of the hierarchy. It contains the following elements (REQUIRED if not marked otherwise):

- /hrf:id - This element uniquely identifies the document, e.g. through a textual representation of a UUID. It is RECOMMENDED to not use absolute URIs that may be assumed to be resolvable to a concrete resource location.
- /hrf:version - The version of the hData Record Format used within this document.
- /hrf:created - Creation date of the document, using the W3C XML Schema Date data type. This data SHOULD be significant to at least the second.
- /hrf:lastModified - Last modification of the document, using the W3C XML Schema Date data type. This data SHOULD be significant to at least the second.
- /hrf:extensions - Node containing a list of extensions (list of hrf:extension elements). Any extension to this specification MUST register itself in this section.
- /hrf:extensions/hrf:extension (OPTIONAL) - This text element contains a unique identifier for the extension. It is RECOMMENDED to use an URL. For elements of content type "application/xml", it is RECOMMENDED that the text element contain a URL that resolves to an XML Schema for instance documents in this extension. For other content types, it is RECOMMENDED that the URL resolve to HTML documentation of the Section Document format.
- /hrf:extensions/hrf:extension/@contentType (OPTIONAL) - This attribute contains the content type that for all documents in a section that register with this extension. If the attribute is not present, the documents in the section MUST be of content type "application/xml".
- /hrf:sections - This node contains references to all component-specific sections (hrf:section)
- /hrf:sections/hrf:section (OPTIONAL) - A hrf:section describes an abstract collection of data elements within an hData record.

- 91 • /hrf:sections/hrf:section/@path - This text attribute is path segment, used to construct the full path to  
92 the section from the root. Valid characters are [a-z][A-Z][0-9]. The full path to a section is obtained by  
93 starting with a forward slash ("/"), and concatenating the path segments, separated by forward slashes.
- 94 • /hrf:sections/hrf:section/@extensionId - This identifier MUST be equal to the identifier of any of the  
95 registered extension elements. It describes the default contentType for documents contained in this  
96 section. Note that the metadata for each individual document MAY override the default contentType.
- 97 • /hrf:sections/hrf:section/@name (OPTIONAL) - Used for a human-friendly name to this section.
- 98 • /hrf:sections/hrf:section/@requirement (OPTIONAL) – this attribute indicates if a given section is  
99 required or optional. Valid values are "required" or "optional". If this attribute is not present, the  
100 section is required. NOTE: This attribute is ignored in the root document, but only used for the hData  
101 Content Profile Description Language (see section 2.6).

102 The root document schema MAY be extended to support additional features such as a mechanism to record  
103 versions of the data contained in the document.

### 104 2.3 Extensions

105 Extensions define the default type of Section Documents that MAY appear in a Section. Extensions MUST be  
106 identified by a unique identifier. It is RECOMMENDED that this unique identifier be a URL. Section Documents  
107 MAY override the default type in their metadata.

108 It is also RECOMMENDED that this URL resolve to an artifact that will assist in the creation, consumption or  
109 validation of Section Documents. The nature of these artifacts is not defined by this specification. It is  
110 RECOMMENDED that Extensions using XML-based Section Documents identify themselves with a URL that  
111 resolves to an XML Schema. For Extensions using other content types, it is RECOMMENDED that they are  
112 identified by a URL that resolves to HTML documentation describing acceptable content in Section  
113 Documents.

### 114 2.4 Sections

115 Sections within an hData record form an abstract hierarchy, similar to the file folder structure commonly used  
116 in hierarchical file systems. Section can contain either Section Documents or other Sections. Sections are  
117 identified by their path. The path to a Section is constructed by starting with a forward slash ("/") and  
118 appending all section path names from the root of the HDR to the Section. Section Documents contained in  
119 Sections comply with the contentType of an Extension registered in the RD. An Extension MUST be listed in  
120 /hrf:extensions for it to be used by a Section.

### 121 2.5 Section Documents

122 At each section a collection of documents can be obtained. Within each Section, the documents MUST conform  
123 to the type defined by the Extension unless declared otherwise by the Section Document's meta data.

#### 124 2.5.1 Section Document Meta Data

125 Each section contains a collection of meta data artifacts that are associated with each Section Document. The  
126 container format for this meta data is Atom, described in [RFC 5023](#). Each Section Document MUST have a  
127 corresponding </atom:feed/atom:entry> element. If the Section Document type is different from the type  
128 defined in the Section's Extension, it MUST indicate it's type in the /atom:feed/atom:entry/atom:link/@type

129 attribute. Each </atom:feed/atom:entry> must contain an <atom:link> element where the href attribute refers  
 130 to the Section Document. Additional meta data is contained in the </atom:feed/atom:entry/atom:content>  
 131 element, in an XML fragment starting with <hrf-md:DocumentMetaData>

- 132 • /hrf-md:DocumentMetaData - DocumentMetaData is the top-level element for the hData meta data  
 133 specification.
- 134 • /hrf-md:DocumentMetaData/hrf-md:PedigreeInfo (OPTIONAL) - This optional node holds the pedigree  
 135 information for the Section Document. It is of type <hrf-md:PedigreeInfo>
- 136 • /hrf-md:DocumentMetaData/hrf-md:DocumentId - This required text element holds an identifier for  
 137 the Section Document. It MUST be unique over any given Section.
- 138 • /hrf-md:DocumentMetaData/hrf-md:LinkedDocuments (OPTIONAL) - This optional node holds a list of  
 139 URI links to documents that are related to this Section Document. Use depends on the semantics of the  
 140 Section Document Type. It can have <hrf-md:LinkInfo> typed child elements.
- 141 • /hrf-md:DocumentMetaData/hrf-md:RecordDate - This required node holds the information about  
 142 Document creation and modification.
- 143 • /hrf-md:DocumentMetaData/hrf-md:RecordDate/hrf-md:CreatedDateTime - This required element of  
 144 type <xs:dateTime> contains the dateTime of creation of this document. If this document is not  
 145 derived (see PedigreeInfo), this is the time of the creation of the original. If this document is derived  
 146 from another origin, this element contains the date of derivation.
- 147 • /hrf-md:DocumentMetaData/hrf-md:RecordDate/hrf-md:Modified (OPTIONAL) - This optional node is  
 148 first created when the document is changed for the first time. It contains a collection of modification  
 149 dates with optional pedigree information of the modifier.
- 150 • /hrf-md:DocumentMetaData/hrf-md:RecordDate/hrf-md:Modified/hrf-md:ModifiedDateTime - This  
 151 required element of type <xs:dateTime> records a dateTime when the document was modified.
- 152 • /hrf-md:DocumentMetaData/hrf-md:RecordDate/hrf-md:Modified/hrf-md:PedigreeInfo (OPTIONAL) –  
 153 This optional node of type <hrf-md:PedigreeInfo> contains the pedigree information of the modifier.
- 154 • /hrf-md:DocumentMetaData/hrf-md:Confidentiality (OPTIONAL) – This element contains controls for  
 155 confidentiality - details are TBD.
- 156 • /hrf-md:DocumentMetaData/hrf-md:AccessControl (OPTIONAL) - This element contains controls for  
 157 access control - details are TBD.
- 158 • /hrf-md:DocumentMetaData/hrf-md:Consent (OPTIONAL) - This element contains controls for consent  
 159 - details are TBD.

160 There are two more types that are being used in <hrf-md:DocumentMetaData>: <hrf-md:PedigreeInfo> and  
 161 <hrf-md:LinkInfo>. This is the schema for <hrf-md:PedigreeInfo>

- 162 • /hrf-md:PedigreeInfo - This node contains the pedigree information.
- 163 • /hrf-md:PedigreeInfo/hrf-md:XmlSignature (OPTIONAL) - This optional node contains the signature  
 164 information on the document or this meta data. This signature MUST conform to the [W3C XML  
 165 Signature Syntax and Processing \(Second Edition\)](#) specification.
- 166 • /hrf-md:PedigreeInfo/hrf-md:XmlSignature/@documentMethod - This optional attribute indicates  
 167 what method was used to transform binary Section Document media types into XML files for signature.  
 168 Currently the only permitted methods are xml, sha256 and base64. xml is the default XML signature  
 169 over XML documents. base64 encodes a data stream into an XML document. The root node is root and

- 170 contains the BASE64 encoded data. sha256 calculates a hash over the binary stream and signs this  
171 hash.
- 172 • /hrf-md:PedigreeInfo/hrf-md:XmlSignature/ds:Signature (0..unbounded) - A collection of XML  
173 Signatures. This Signature MUST contain:
    - 174 1. A valid Reference to either the metadata or the Section Document
    - 175 2. The ds:KeyInfo for the signer (optional with DSig - required here)
  - 176 • /hrf-md:PedigreeInfo/hrf-md:Source (OPTIONAL) - This node indicates the source of this data.
  - 177 • /hrf-md:PedigreeInfo/hrf-md:Source/@derived - If the data is derived (i.e. copied or compiled from  
178 other sources) this attribute of type <xs:boolean> MUST be set to true.
  - 179 • /hrf-md:PedigreeInfo/hrf-md:Source/hrf-md:PedigreeInfo (0..unbounded) – This element contains the  
180 <hrf-md:PedigreeInfo> of the all source from which this document was derived.
  - 181 • /hrf-md:PedigreeInfo/hrf-md:Source/hrf-md:Document (0..unbounded) – This element of type <hrf-  
182 md:LinkInfo> contains links to all documents from which this document was derived.
  - 183 • /hrf-md:PedigreeInfo/hrf-md:Author (0..unbounded) – This element contains the names or identifiers  
184 of all author(s).
  - 185 • /hrf-md:PedigreeInfo/hrf-md:Organization (0..unbound) - This element identified the organization(s)  
186 at which this document was created.

187 This is the schema for <hrf-md:LinkInfo>:

- 188 • /hrf-md:LinkInfo – This node contains the link information
- 189 • /hrf-md:LinkInfo/hrf-md:Target –This required element of type <xs:anyURI> contains the absolute link  
190 to the referenced Section Document.
- 191 • /hrf-md:LinkInfo/##any (OPTIONAL) – extension point.

## 192 2.6 hData Content Profiles

193 This specification does not specify which sections are required for an hData Record. This is done in separate  
194 hData Content Profiles (HCP).

195 To describe hData Content Profiles, the following schema is used for the HCP definition file:

- 196 • /hrf:hcp – the root element for a HCP definition file.
- 197 • /hrf:hcp/@name – a simple display name
- 198 • /hrf:hcp/@id – a URI identifying the hData Content Profile. It is RECOMMENDED to use a URL that can  
199 be resolved into the HCP definition document.
- 200 • /hrf:hcp/hrf:extensions – this element describes the extensions used in this HCP. It uses the same  
201 syntax as in the root document as described in section 2.2.
- 202 • /hrf:hcp/hrf:sections – this element describes the sections that are to be included in a hData record  
203 that claims conformance to the HCP. It uses the same syntax as in the root document as described in  
204 section 2.2. NOTE: the requirements attribute is being used in the HCP, as described above.

## 205 3 Normative Schemas

### 206 3.1 Root Document

207 This section contains the normative schema for the root document (see Section 2.2).

```
208 <?xml version="1.0" encoding="UTF-8"?>
209 <!-- Copyright 2009 The MITRE Corporation
210
211 Licensed under the Apache License, Version 2.0 (the "License");
212 you may not use this file except in compliance with the License.
213 You may obtain a copy of the License at
214
215 http://www.apache.org/licenses/LICENSE-2.0
216
217 Unless required by applicable law or agreed to in writing, software
218 distributed under the License is distributed on an "AS IS" BASIS,
219 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
220 implied.
221 See the License for the specific language governing permissions and
222 limitations under the License. -->
223
224 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
225 elementFormDefault="qualified"
226 targetNamespace="http://projecthdata.org/hdata/schemas/2009/06/core"
227 xmlns:core="http://projecthdata.org/hdata/schemas/2009/06/core">
228   <xs:element name="root">
229     <xs:complexType>
230       <xs:all>
231         <xs:element ref="core:id"/>
232         <xs:element ref="core:version"/>
233         <xs:element ref="core:created"/>
234         <xs:element ref="core:lastModified"/>
235         <xs:element ref="core:extensions"/>
236         <xs:element ref="core:sections"/>
237       </xs:all>
238     </xs:complexType>
239   </xs:element>
240   <xs:element name="id" type="xs:string"/>
241   <xs:element name="version" type="xs:string"/>
242   <xs:element name="created" type="xs:date"/>
243   <xs:element name="lastModified" type="xs:date"/>
244   <xs:element name="extensions">
245     <xs:complexType>
246       <xs:sequence>
247         <xs:element minOccurs="0" maxOccurs="unbounded"
248 ref="core:extension"/>
249       </xs:sequence>
250     </xs:complexType>
251   </xs:element>
```



```

252 <xs:element name="extension">
253   <xs:complexType mixed="true">
254     <xs:attributeGroup ref="core:extension"/>
255   </xs:complexType>
256 </xs:element>
257 <xs:element name="sections">
258   <xs:complexType>
259     <xs:sequence>
260       <xs:element minOccurs="0" maxOccurs="unbounded"
261 ref="core:section"/>
262     </xs:sequence>
263   </xs:complexType>
264 </xs:element>
265 <xs:attributeGroup name="extension">
266   <xs:attribute name="contentType" type="xs:string"
267 use="optional"/>
268 </xs:attributeGroup>
269 <xs:element name="section">
270   <xs:complexType>
271     <xs:sequence>
272       <xs:element minOccurs="0" maxOccurs="unbounded"
273 ref="core:section"/>
274     </xs:sequence>
275     <xs:attribute name="path" use="required"/>
276     <xs:attribute name="name" use="optional"/>
277     <xs:attribute name="extensionId" use="required"/>
278     <xs:attribute name="requirement" use="optional">
279       <xs:simpleType>
280         <xs:restriction base="xs:token">
281           <xs:enumeration value="mandatory"/>
282           <xs:enumeration value="optional"/>
283         </xs:restriction>
284       </xs:simpleType>
285     </xs:attribute>
286   </xs:complexType>
287 </xs:element>
288 </xs:schema>

```

289

### 290 3.2 hData Content Profile Definition

291 This section contains the normative profile for the hData Content Profile definition (see section 2.6).

```

292 <?xml version="1.0" encoding="UTF-8"?>
293 <!-- Copyright 2009 The MITRE Corporation
294
295 Licensed under the Apache License, Version 2.0 (the "License");
296 you may not use this file except in compliance with the License.
297 You may obtain a copy of the License at
298

```



```

299 http://www.apache.org/licenses/LICENSE-2.0
300
301 Unless required by applicable law or agreed to in writing, software
302 distributed under the License is distributed on an "AS IS" BASIS,
303 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
304 implied.
305 See the License for the specific language governing permissions and
306 limitations under the License. -->
307
308 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
309 elementFormDefault="qualified"
310 targetNamespace="http://projecthdata.org/hdata/schemas/2010/04/hcp"
311 xmlns:hcp="http://projecthdata.org/hdata/schemas/2010/04/hcp"
312 xmlns:core="http://projecthdata.org/hdata/schemas/2009/06/core">
313   <xs:element name="hcp">
314     <xs:complexType>
315       <xs:all>
316         <xs:element ref="core:extensions"/>
317         <xs:element ref="core:sections"/>
318       </xs:all>
319       <xs:attribute name="name" use="required" type="xs:string" />
320       <xs:attribute name="id" use="required" type="xs:anyURI" />
321     </xs:complexType>
322   </xs:element>
323 </xs:schema>

```

324

### 3.3 Section Document Meta Data

326 This section contains the normative schema for the Section Document meta data (see Section 2.5.1).

```

327 <?xml version="1.0" encoding="UTF-8"?>
328 <!-- Copyright 2009 The MITRE Corporation
329
330     Licensed under the Apache License, Version 2.0 (the "License");
331     you may not use this file except in compliance with the License.
332     You may obtain a copy of the License at
333
334     http://www.apache.org/licenses/LICENSE-2.0
335
336     Unless required by applicable law or agreed to in writing,
337 software
338     distributed under the License is distributed on an "AS IS" BASIS,
339     WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
340 implied.
341     See the License for the specific language governing permissions
342 and
343     limitations under the License. -->
344
345 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"

```

```

346     xmlns:hd-
347 md="http://projecthdata.org/hdata/schemas/2009/11/metadata"
348     xmlns:ds="http://www.w3.org/2000/09/xmlnsig#"
349
350 targetNamespace="http://projecthdata.org/hdata/schemas/2009/11/metada
351 ta">
352     <xs:import namespace="http://www.w3.org/2000/09/xmlnsig#"
353         schemaLocation="http://www.w3.org/TR/2002/REC-xmlnsig-
354 core-20020212/xmlnsig-core-schema.xsd"/>
355     <xs:complexType name="DocumentMetaData">
356         <xs:annotation>
357             <xs:documentation>
358                 DocumentMetaData is the top-level element for the
359 hData meta data specification. It is
360                 embedded with every Atom 1.0 Content node.
361             </xs:documentation>
362         </xs:annotation>
363         <xs:sequence>
364             <xs:element minOccurs="0" name="PedigreeInfo" type="hd-
365 md:PedigreeInfo">
366                 <xs:annotation>
367                     <xs:documentation>
368                         This optional node holds the pedigree
369 information for the Section Document.
370                     </xs:documentation>
371                 </xs:annotation>
372             </xs:element>
373             <xs:element name="DocumentId" type="xs:string">
374                 <xs:annotation>
375                     <xs:documentation>
376                         This required element holds an identifier for
377 the Section Document. It MUST be unique over any given
378                         Section feed.
379                     </xs:documentation>
380                 </xs:annotation>
381             </xs:element>
382             <xs:element minOccurs="0" name="LinkedDocuments">
383                 <xs:annotation>
384                     <xs:documentation>
385                         This optional node holds a list of URI links
386 to documents that are related to this
387                         Section Document. Use depends on the
388 semantics of the Section Document Type.
389                     </xs:documentation>
390                 </xs:annotation>
391             </xs:complexType>
392             <xs:sequence>
393                 <xs:element maxOccurs="unbounded" name="Link"
394 type="hd-md:LinkInfo"/>
395             </xs:sequence>

```

```

396         </xs:complexType>
397     </xs:element>
398     <xs:element name="RecordDate">
399         <xs:annotation>
400             <xs:documentation>
401                 This required node holds the information
402 about Document creation and modification.
403             </xs:documentation>
404         </xs:annotation>
405         <xs:complexType>
406             <xs:sequence>
407                 <xs:element name="CreatedDateTime"
408 type="xs:dateTime">
409                     <xs:annotation>
410                         <xs:documentation>
411                             This required element contains
412 the dateTime of creation of this document.
413                             If this document is not derived
414 (see PedigreeInfo), this is the time of the
415                             creation of the original. If this
416 document is derived from another origin, this element
417                             contains the date of derivation.
418                         </xs:documentation>
419                     </xs:annotation>
420                 </xs:element>
421                 <xs:element minOccurs="0" name="Modified">
422                     <xs:annotation>
423                         <xs:documentation>
424                             This optional node is first
425 created when the document is changed for the first time.
426                             It contains a collection of
427 modification dates with optional pedigree information of the
428                             modifier.
429                         </xs:documentation>
430                     </xs:annotation>
431                 </xs:complexType>
432                 <xs:sequence minOccurs="1"
433 maxOccurs="unbounded">
434                     <xs:element
435 name="ModifiedDateTime" type="xs:dateTime">
436                         <xs:annotation>
437                             <xs:documentation>
438                                 This required element
439 record a dateTime when the document was modified.
440                             </xs:documentation>
441                         </xs:annotation>
442                     </xs:element>
443                 </xs:sequence minOccurs="0"
444 name="PedigreeInfo"
445                                     type="hd-md:PedigreeInfo">

```

```

446                                     <xs:annotation>
447                                         <xs:documentation>
448                                             This optional node
449 contains the pedigree information of the modifier.
450                                         </xs:documentation>
451                                     </xs:annotation>
452                                 </xs:element>
453                             </xs:sequence>
454                         </xs:complexType>
455                     </xs:element>
456                 </xs:sequence>
457             </xs:complexType>
458         </xs:element>
459     <xs:element minOccurs="0" name="Confidentiality"
460 type="xs:string">
461         <xs:annotation>
462             <xs:documentation>
463                 This element contains controls for
464 confidentiality - details are TBD.
465             </xs:documentation>
466         </xs:annotation>
467     </xs:element>
468     <xs:element minOccurs="0" name="AccessControl">
469         <xs:annotation>
470             <xs:documentation>
471                 This element contains controls for access
472 control - details are TBD.
473             </xs:documentation>
474         </xs:annotation>
475     </xs:element>
476     <xs:element minOccurs="0" name="Consent">
477         <xs:annotation>
478             <xs:documentation>
479                 This element contains controls for consent -
480 details are TBD.
481             </xs:documentation>
482         </xs:annotation>
483     </xs:element>
484 </xs:sequence>
485 <xs:attribute name="MediaType" type="xs:string">
486     <xs:annotation>
487         <xs:documentation>
488             This attribute contains the media type of the
489 document itself. If it is not present, the
490 default media type of the content type is
491 assumed.
492         </xs:documentation>
493     </xs:annotation>
494 </xs:attribute>
495 </xs:element>

```

```

496     </xs:attribute>
497     <xs:attribute name="ContentType" type="xs:anyURI"
498 use="optional">
499         <xs:annotation>
500             <xs:documentation>
501                 This attribute contains the URI for the content
502 type of this document. If it is not present,
503                 the content type for the Section is implied. Note
504 that the current hData Content Profiles assume
505                 that the content type for all Section Documents
506 within a given Section is uniform.
507             </xs:documentation>
508         </xs:annotation>
509     </xs:attribute>
510 </xs:complexType>
511 <xs:complexType name="PedigreeInfo">
512     <xs:annotation>
513         <xs:documentation>
514             This node contains the pedigree information.
515         </xs:documentation>
516     </xs:annotation>
517     <xs:sequence>
518         <xs:element minOccurs="0" name="XmlSignature"
519 maxOccurs="unbounded">
520             <xs:annotation>
521                 <xs:documentation> This optional node contains
522 the signature information on
523                 the document or this meta data.
524             </xs:documentation>
525         </xs:annotation>
526         <xs:complexType>
527             <xs:sequence>
528                 <xs:element ref="ds:Signature">
529                     <xs:annotation>
530                         <xs:documentation> This Signature
531 MUST contain: 1. a valid Reference
532                         to either the metadata or the
533 Section Document 2. the ds:KeyInfo
534                         for the signer (optional with
535 DSig - required here)
536                     </xs:documentation>
537                 </xs:annotation>
538             </xs:element>
539         </xs:sequence>
540
541         <xs:attribute name="documentMethod">
542             <xs:annotation>
543                 <xs:documentation>This optional attribute
544 indicates what method was used
545

```

```

546         to transform binary Section Document
547 mediatypes into XML files for
548         signature. Currently the only permitted
549 methods are xml and base64.
550         xml is the default XML signature over XML
551 documents. base64 encodes
552         a data stream into an XML document. The
553 root node is root and
554         contains the BASE64 encoded data.
555 </xs:documentation>
556         </xs:annotation>
557         <xs:simpleType>
558             <xs:restriction base="xs:string">
559                 <xs:enumeration value="base64"/>
560                 <xs:enumeration value="xml"/>
561                 <xs:enumeration value="sha256"/>
562             </xs:restriction>
563         </xs:simpleType>
564     </xs:attribute>
565 </xs:complexType>
566 </xs:element>
567 <xs:element minOccurs="0" maxOccurs="1" name="Source">
568     <xs:annotation>
569         <xs:documentation>This node indicates the source
570 of this data. </xs:documentation>
571     </xs:annotation>
572 </xs:complexType>
573     <xs:sequence>
574         <xs:element name="PedigreeInfo" type="hd-
575 md:PedigreeInfo" minOccurs="0"/>
576         <xs:element maxOccurs="unbounded"
577 minOccurs="0" name="Document"
578             type="hd-md:LinkInfo"/>
579     </xs:sequence>
580     <xs:attribute name="derived" type="xs:boolean">
581         <xs:annotation>
582             <xs:documentation>If the data is derived
583 (i.e. copied or compiled from other sources) this attribute MUST be
584 set to true. </xs:documentation>
585         </xs:annotation>
586     </xs:attribute>
587 </xs:complexType>
588 </xs:element>
589 <xs:element minOccurs="0" name="Author" type="xs:string">
590     <xs:annotation>
591         <xs:documentation>The identifier of the creators
592 of this document. For derived documents, this is the author. Note
593 that this identifier can identify machines as well as humans.
594 </xs:documentation>
595     </xs:annotation>

```

```

596         </xs:element>
597         <xs:element minOccurs="0" name="Organization"
598 type="xs:string">
599             <xs:annotation>
600                 <xs:documentation>This element identifies the
601 organization. </xs:documentation>
602             </xs:annotation>
603         </xs:element>
604     </xs:sequence>
605 </xs:complexType>
606 <xs:complexType name="LinkInfo">
607     <xs:sequence>
608         <xs:element name="Target" type="xs:anyURI"/>
609         <xs:any maxOccurs="unbounded" minOccurs="0"/>
610     </xs:sequence>
611 </xs:complexType>
612 </xs:schema>
613

```

#### 614 4 Informative Example (Non-Normative)

615 This section contains an example of an hData Record that conforms to a notional Laboratory Result Content  
616 Profile. The following is an example Root Document:

```

617 <?xml version="1.0" encoding="UTF-8"?>
618 <root xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
619     xmlns="http://projecthdata.org/hdata/schemas/2009/06/core">
620     <documentId>documentid0</documentId>
621     <version>0.10</version>
622     <created>2010-02-09</created>
623     <lastModified>2010-02-09</lastModified>
624     <extensions>
625         <extension
626 requirement="mandatory">http://projecthdata.org/hdata/schemas/2009/06
627 /insurance_provider</extension>
628         <extension
629 requirement="mandatory">http://projecthdata.org/hdata/schemas/2009/06
630 /patient_information</extension>
631         <extension
632 requirement="mandatory">http://projecthdata.org/hdata/schemas/2009/06
633 /result</extension>
634         <extension
635 requirement="mandatory">http://projecthdata.org/hdata/schemas/2010/01
636 /order</extension>
637     </extensions>
638     <sections>
639         <section
640 typeId="http://projecthdata.org/hdata/schemas/2009/06/patient_informa
641 tion" path="patient_information" name="Patient Information"/>

```

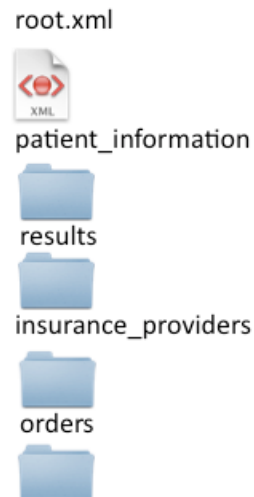


```

642     <section
643 typeId="http://projecthdata.org/hdata/schemas/2009/06/result"
644 path="results" name="Results"/>
645     <section
646 typeId="http://projecthdata.org/hdata/schemas/2009/06/insurance_provi
647 der" path="insurance_providers" name="Insurance Provider"/>
648     <section
649 typeId="http://projecthdata.org/hdata/schemas/2010/01/order"
650 path="orders" name="Orders"/>
651     </sections>
652 </root>
653

```

654 The record registers four extensions: Insurance Provider, Patient Information, Result and Order. It then lists  
 655 four sections for each of these extensions, resulting in the following structure:



656 The contents of this structure would be as follows:

- 657 • patient\_information – This section contains demographic information about the patient. Typically, this
- 658 section will contain a single Section Document.
- 659 • results – Laboratory results, with each result placed in its own Section Document
- 660 • insurance\_providers – Payer information
- 661 • orders – Laboratory orders

662

## 5 Bibliography

- [1] G. Beuchelt, R. Dingwell, A. Gregorowicz, and H. Sleeper, "hData Packaging and Network Transport Specification," The MITRE Corporation, 2009.

