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CIMI XML Schema for SPECTRUM
Supporting documentation

Schema version number 1.5
October 15th 2002

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1   About this document

This document describes the scope and content of version 1.5 of the CIMI XML Schema for SPECTRUM. It provides examples of the use of the Schema and instructions for its use by Implementers during the Alpha Test Period following the public release of version 1.5 of the Schema in October 2003.

The CIMI Schema will enable museums to encode rich descriptive information relating to museum objects, including associated information about people, places and events surrounding the history of museum objects, as well as information about their management and use within museums.

2   About the CIMI Schema for SPECTRUM

2.1   Scope of the CIMI Schema

The CIMI Schema for SPECTRUM enables the XML encoding of individual items in museum collections, across the full scope of Edition 2 of SPECTRUM: The UK Museum Documentation Standard.

2.2   Relationship to SPECTRUM

The scope of the CIMI Schema for SPECTRUM is defined by the Units of Information included in Edition 2 of SPECTRUM, with the following exceptions:

2.2.1   As a result of updates undertaken in the initial publishing/production process, Edition 2 of SPECTRUM Interactive may differ from some earlier revisions of the printed version of SPECTRUM Edition 2.

2.2.2   Updates to the CIMI Schema have already been made which have resulted in differences in the naming and/or definitions of Units of information between the CIMI Schema and Edition 2 of SPECTRUM. These changes have been made to the Schema in order to ensure coherence and correct functionality of XML documents encoded using the Schema. All such amendments are documented in the Schema Issues Log at http://www.cimi.org/wg/xml_spectrum/index.html. **mda** intend to feed these and other issues into the planned publication of SPECTRUM Edition 3.

3   Schema development and documentation

3.1   Development process

The CIMI Schema for SPECTRUM was developed within CIMI's XML Working Group. Development and testing was undertaken by CIMI members and was coordinated and documented by CIMI staff.

The development of the DTDs which preceded CIMI's XML Schema for SPECTRUM is documented in a separate evaluation report: *CIMI XML Test Bed*

Project: Stage 1 Review, available to CIMI members from the CIMI XML Project site at http://www.cimi.org/wg/xml_spectrum/index.html.

The process for creating the Schema was broadly as follows

- The source document for the Schema was an XML-tagged copy of the definitions of the Units of Information from SPECTRUM Interactive Edition 2. SPECTRUM Interactive Edition 2 is available to CIMI members from mda http://www.mda.org.uk.
- This XML document was read into a database. This produced a record for each element.
- The records were connected in a hierarchy, making up the nodes when needed and grouping then logically
- The XML tags were simplified to their 'smallest unit' level, so each original Unit of information got a shorter name, with the relevant branch of the tree providing the meaning.
- Minimum and maximum occurrences were added, defining whether individual Units of information and also groups of Units of information were optional, mandatory or repeatable.
- An output procedure was written to 'write' the schema, complex types were generated.
- The result was parsed using Microsoft Visual Studio .Net schema validator and all errors/warnings were corrected.
- The original descriptions and unit names were added as annotations to facilitate mapping.
- Subsequent versions of the Schema have been validated using XML Spy.
- The resulting Schema was then reviewed by Technical Partners in the CIMI Test Bed and checked against the published version of SPECTRUM Interactive Edition 2.

3.2 Schema development documentation

Decisions made during the development of the Schema up to and including Version 1.5 are documented in the Schema Issues Log posted on the CIMI XML Project site http://www.cimi.org/wg/xml_spectrum/index.html.

Discrepancies and issues prior to the launch of version 1.5 of the Schema are logged in the Schema Issues Log at http://www.cimi.org/wg/xml_spectrum/index.html.

4 Evaluation and testing of the CIMI Schema for SPECTRUM

4.1 Accessing the CIMI Schema and associated documentation

The CIMI Schema for SPECTRUM is available via the CIMI XML Project site at http://www.cimi.org/wg/xml_spectrum/index.html. Implementers and reviewers of the CIMI Schema will be asked to register specific information in order to download the Schema. CIMI will use registration information to manage the Alpha Test Period (see 6.3.3 below) and to ensure that users are kept informed about the continued development and use of the Schema. Information about Implementers will be held in confidence by CIMI and will not be passed on to

third parties, or used by CIMI except in connection with the testing of the CIMI Schema.

Also available on the CIMI XML Project site are:

- datasets demonstrating the use of the Schema;
- supporting documentation;

- the Online Issue Log documenting issues and decisions addressed during the development of the CIMI Schema up to and including Version 1.5;

- access to the Implementers' Issue log (see 6.2 below);

- Frequently Asked Questions.

Implementers and reviewers are encouraged to consult these documents which provide valuable context and background to support the implementation of the CIMI Schema.

4.2 Logging and resolving issues

Version 1.5 is the first public release of the CIMI Schema for SPECTRUM. Due to the broad scope of the Schema it is expected that issues will arise during its use which CIMI members have not encountered during testing to date. Implementers are asked to log all issues which they might encounter during the implementation or review process.

4.2.1 Online Issue Log

Any issues and problems encountered in implementing the Schema should be logged in the Online Issue Log accessible from http://www.cimi.org/wg/xml_spectrum/index.html. Issues will be checked by CIMI prior to posting on the public log. Where appropriate an initial response to the issue will be posted along with the logged issue, to be followed by details of any action which it is recommended that implementers should take in order to resolve issues locally.

4.2.2 Discussion list

All implementers will be invited to join the CIMI Schema Discussion List. Prior to posting an issue on the Log, Implementers are encouraged to post details to the list, seeking comment or assistance where appropriate. CIMI will also consult Implementers via the list in order to inform any local fixes to the Schema which might be required.

4.2.3 Local adaptations of, or extensions to the CIMI Schema

In order to remove the need to update the CIMI Schema during the Alpha Test Period, Implementers should implement any changes to the Schema at a local level. Areas of the CIMI Schema which Implementers have changed should be assigned a separate Namespace. In order to enable CIMI to manage and collate local changes to the Schema prior to the Implementers' Forum (see 4.3 below), Implementers will be asked to:

- notify CIMI of local Namespaces as they are assigned;

- inform CIMI of the scope and nature of any local changes made with reference to specific issues identified in the Online Issues Log.

4.3 Implementers' Forum

CIMI plans to hold at least one Implementers' Forum following the conclusion of the Alpha Test Period in June 2003. The aim of the Implementers' Forum will be to evaluate feedback arising from the use of the CIMI Schema during its first release. However CIMI is aware that in order to be implemented successfully in the future, the Schema will need to be used consistently, and it will also need to be extensible. CIMI will therefore invite the Implementers' Forum to address issues of how the community can manage the ongoing extension and management of the Schema in the future.

CIMI will collate and publish all the issues documented in the Online Issues Log prior to the Implementers' Forum, together with details of local amendments to the CIMI Schema which have been made by Implementers, in order that Implementers attending the Forum can formally agree updates to the CIMI Schema.

CIMI aims to enable publication of Version 2 of the Schema in November 2003. This version will contain the amendments resulting from the Alpha Test Period.

5 Using the CIMI Schema to encode museum information

Some areas of museum records can be particularly complex to handle. In response to issues raised during the development of the CIMI Schema, the following examples of been provided to illustrate the way in which SPECTRUM handles key concepts in the description of objects, and how it is intended that these be encoded using CIMI's XML Schema for SPECTRUM.

5.1 Test-bed datasets

The CIMI XML Test-bed succeeded in its aim to demonstrate the potential of the CIMI Schema to encode data from a wide range of museum collections. Below is an example of a dataset encoded using Schema version 1.5. Further datasets encoded using version 1.4 are available on the CIMI XML Project site at http://www.cimi.org/wg/xml_spectrum/index.html.

```
- <cs:interchange

  - <cs:record>

    - <cs:data>

      - <cs:object>

        - <cs:acquisition>

          - <cs:date>

            - <cs:earliest>

                <cs:date>1892</cs:date>

              </cs:earliest>

            </cs:date>
```

```xml
- <cs:source>
  - <cs:source>
    - <cs:person>
      - <cs:name>
          <cs:forename>Paul Howard</cs:forename>

          <cs:surname>MacGillivray</cs:surname>
        </cs:name>
      </cs:person>
    </cs:source>
  </cs:source>
</cs:acquisition>
- <cs:associations>
  - <cs:general-associations>
      <cs:concept>Birds</cs:concept>
    </cs:general-associations>
  - <cs:general-associations>
      <cs:concept>Seabirds</cs:concept>
    </cs:general-associations>
  - <cs:general-associations>
      <cs:concept>Sula bassana</cs:concept>
    </cs:general-associations>
  - <cs:general-associations>
      <cs:concept>Gannet</cs:concept>
    </cs:general-associations>
  - <cs:general-associations>
      <cs:concept>Natural History</cs:concept>
    </cs:general-associations>
  - <cs:general-associations>
      <cs:concept>Artworks</cs:concept>
    </cs:general-associations>
  - <cs:general-associations>
      <cs:concept>Paintings</cs:concept>
```

```xml
      </cs:general-associations>
    - <cs:specific-associations>
        <cs:association-type>Contributor of data to
          RLG Cultural Materials</cs:association-
          type>
      - <cs:association>
        - <cs:organisation>
          - <cs:address>
            - <cs:place>
                <cs:name>Cromwell
                  Road</cs:name>
                <cs:name-
                  type>street</cs:name-
                  type>
              </cs:place>
            - <cs:place>

                <cs:name>London</cs:n
                  ame>
                <cs:name-
                  type>city</cs:name-
                  type>
              </cs:place>
            - <cs:place>
                <cs:name>United
                  Kingdom</cs:name>
                <cs:name-
                  type>country</cs:name-
                  type>
              </cs:place>
              <cs:postcode>SW7
                5BD</cs:postcode>
            </cs:address>
            <cs:name>Natural History
              Museum</cs:name>
          </cs:organisation>
        </cs:association>
      </cs:specific-associations>
    </cs:associations>
```

```
- <cs:description>
  - <cs:dimension>
      <cs:dimension>Height</cs:dimension>
      <cs:unit>mm</cs:unit>
      <cs:value>763</cs:value>
    </cs:dimension>
  - <cs:dimension>
      <cs:dimension>Width</cs:dimension>
      <cs:unit>mm</cs:unit>
      <cs:value>553</cs:value>
    </cs:dimension>
  - <cs:inscription>
      <cs:description>Inscription on reverse:
        "Gannet. Sula alba. Nearly two years old,
        the adult plumage almost complete.
        From an individual obtained on the Bass,
        and lent by W. Stables Esq. Edinburgh,
        May, 1831. W.McG"</cs:description>
    </cs:inscription>
  - <cs:material>
      <cs:keyword>Watercolour on
        paper</cs:keyword>
    </cs:material>
  </cs:description>
- <cs:identification>
    <cs:brief-description>Part of the largely
      unpublished collection of the work of William
      MacGillivray [1796-1852]. The collection was
      presented to The Natural History Museum by
      MacGillivray's son, Paul, in 1892. Pencil and
      watercolour. Drawn to accompany his 5
      volumes on British birds, MacGillivray's
      paintings are stunning works of art.
      MacGillivray captures the spirit of the Gannet
      with his delicate touch, while retaining
      scientific accuracy. Genus: Sula. Species:
      bassana. Owner of specimen depicted:
      William Stables. Specimen captured at: East
      Lothian, Bass Rock.</cs:brief-description>
  - <cs:object-name>
```

```
          <cs:author>Natural History
            Museum</cs:author>
          <cs:name>Watercolors</cs:name>
      </cs:object-name>
  - <cs:object-name>
          <cs:author>RLG</cs:author>
          <cs:name>visual arts</cs:name>
          <cs:system>RLG Cultural Materials Work
            Type</cs:system>
      </cs:object-name>
      <cs:object-number>UKHMMacGill001</cs:object-
        number>
  - <cs:object-title>
          <cs:title>Gannet: Sula bassana</cs:title>
      </cs:object-title>
  - <cs:other-number>
          <cs:type>Source Record ID</cs:type>
          <cs:value>UKHMMacGill001</cs:value>
      </cs:other-number>
  </cs:identification>
- <cs:production>
  - <cs:date>
      - <cs:earliest>
            <cs:date>May, 1831</cs:date>
        </cs:earliest>
    </cs:date>
  - <cs:person>
      - <cs:birth>
          - <cs:date>
              - <cs:earliest>
                    <cs:date>1796</cs:date>
                </cs:earliest>
            </cs:date>
        </cs:birth>
      - <cs:death>
```

```
   - <cs:date>
    - <cs:earliest>
         <cs:date>1851</cs:date>
       </cs:earliest>
     </cs:date>
   </cs:death>
  - <cs:name>
       <cs:forename>William</cs:forename>
       <cs:surname>MacGillivray</cs:surname>
     </cs:name>
   </cs:person>
 - <cs:place>
      <cs:name>Edinburgh</cs:name>
   </cs:place>
 - <cs:place>
      <cs:name>Lothian</cs:name>
   </cs:place>
 </cs:production>
- <cs:reproduction>

      <cs:location>UKHMCMI/MacGillivray/PCD334
      6/PCD3346T/Img0001T.jpg</cs:location>
    <cs:note>Dg_Surr_Seq_Num 1</cs:note>
    <cs:note>Dg_Surr_Pref Y</cs:note>
    <cs:type>ImageSourceThumbnailURL</cs:type>
  </cs:reproduction>
- <cs:reproduction>

      <cs:location>UKHMCMI/MacGillivray/PCD334
      6/Img0001X.jpg</cs:location>
    <cs:note>Dg_Surr_Seq_Num 1</cs:note>
    <cs:note>Dg_Surr_Pref Y</cs:note>
    <cs:type>ImageSourceHiResURL</cs:type>
  </cs:reproduction>
- <cs:rights>
```

```xml
- <cs:reproduction-rights>
  - <cs:holder>
    - <cs:organisation>
      - <cs:address>
        - <cs:place>
            <cs:name>Cromwell Road</cs:name>
            <cs:name-type>street</cs:name-type>
          </cs:place>
        - <cs:place>
            <cs:name>London</cs:name>
            <cs:name-type>city</cs:name-type>
          </cs:place>
        - <cs:place>
            <cs:name>United Kingdom</cs:name>
            <cs:name-type>country</cs:name-type>
          </cs:place>
          <cs:postcode>SW7 5BD</cs:postcode>
        </cs:address>
        <cs:name>Natural History Museum</cs:name>
      </cs:organisation>
    </cs:holder>
  </cs:reproduction-rights>
</cs:rights>
</cs:object>
</cs:data>
- <cs:metadata>
```

```
        <cs:progress>Mapped and converted from RLG Cultural
           Materials by Fae Hamilton, RLG, May,
           2002.</cs:progress>
      </cs:metadata>
   </cs:record>
</cs:interchange>
```

The CIMI Schema is extremely broad in scope and it is unrealistic to expect data from any one institution to utilise all areas of the Schema. One aim of the Alpha Test Period therefore is to explore areas of the Schema which it is not possible to test within a relatively small user community.

5.2   Guidance for the use of the Schema within specific areas

Each example below includes local updates to SPECTRUM, undertaken by CIMI in agreement with **mda** and which are documented in the CIMI Schema Issues Log at http://www.cimi.org/wg/xml_spectrum/index.html. The issues reflected by these amendments have been submitted to **mda** for consideration in future editions of SPECTRUM.

The examples below illustrate areas of the Schema relating to complex issues in the description of museum objects. This section is not intended to provide explanations of the issues described, which will be familiar to those associated with the museum sector. Implementers requiring further details are invited to post queries on the XML Discussion List, where CIMI staff and members will be happy to respond.

5.2.1   Wholes & parts
Example 1

A museum object and related parts described using the SPECTRUM Units of Information.

Record 1
Object number:	777
Object name:	dining room
Related object number:	123
Related object association:	part
Part of object?	N

Record 2
Object number:	123
Object name:	teaset
Related object number:	123.1
Related object association:	part
Part of object?	N
Related object number:	123.2
Related object association:	part
Part of object?	N

Related object number: 777
Related object association: parent
Part of object?   Y

Record 3

Object number: 123.1
Object name: cup
Related object number: 123
Related object association: parent
Part of object?   Y

Record 4

Object number: 123.2
Object name: saucer
Related object association: 123
Related object association: parent
Part of object?   Y

A museum object and related parts described using elements from the CIMI Schema.

Record 1

```
<object>
  <identification>
      <object-number>777</object-number>
      <object-name>
        <name>dining room</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>123</number>
      <type>part</type>
      <part-of>N</part-of>
    </object>
  </association>
</object>
```

Record 2

```
<object>

  <identification>
    <object-number>123</object-number>
      <object-name>
        <name>teaset</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>123.1</number>
      <type>part</type>
      <part-of>N</part-of>
```

```
        </object>
      </association>
      <association>
        <object>
          <number>123.2</number>
          <type>part</type>
          <part-of>N</part-of>
        </object>
      </association>
    </object>
```

Record 3

```
<object>
  <identification>
      <object-number>123.1</object-number>
      <object-name>
        <name>cup</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>123</number>
      <type>parent</type>
      <part-of>Y</part-of>
    </object>
  </association>
</object>
```

Record 4

```
<object>
  <identification>
      <object-number>123.2</object-number>
      <object-name>
        <name>saucer</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>123</number>
      <type>parent</type>
      <part-of>Y</part-of>
    </object>
  </association>
</object>
```

Example 2

A museum object and related parts described using the SPECTRUM Units of Information.

Record 1
Object number: 456
Object name: album
Related object number: 456.1
Related object association: part
Part of object?   N

Record 2

Object number: 456.1
Object name: print
Related object number: 456
Related object association: parent
Part of object?   Y

A museum object and related parts described using elements from the CIMI Schema.

Record 1

```
<object>
  <identification>
    <object-number>456</object-number>
      <object-name>
          <name>album</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>456.1.1</number>
      <type>part</type>
      <part-of>N</part-of>
    </object>
  </association>
</object>
```

Record 2

```
<object>
  <identification>
      <object-number>456.1</object-number>
      <object-name>
        <name>print</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>456</number>
      <type>parent</type>
      <part-of>Y</part-of>
    </object>
  </association>
</object>
```

5.2.2 Other relationships between objects

Related museum objects described using the SPECTRUM Units of Information.

Object number: 789
Object name: tablecloth
Related object number: 987
Related object association: colourway
Part of object? N

Related museum objects described using elements from the CIMI Schema.

```
<object>
  <identification>
    <object-number>789</object-number>
      <object-name>
          <name>tablecloth</name>
      </object-name>
  </identification>
  <association>
    <object>
      <number>987</number>
      <type>colourway</type>
      <part-of>N</part-of>
    </object>
  </association>
</object>
```

5.2.3 Component descriptions

Components are defined as unnumbered elements of an object.

Object components described using the SPECTRUM Units of Information.

Object number: 246
Object name: knife

Object component name: handle
Object component information: material
(*this value should be the name of the relevant Unit of Information being used to describe the component*)
Material: bone

Object component name: handle
Object component information: technique
Technique: carved

Object component name: blade
Object component information: material
Material: steel

Object components described using elements from the CIMI Schema.

```xml
<object>
  <identification>
    <object-number>246</object-number>
      <object-name>
          <name>knife</name>
      </object-name>
  </identification>
  <description>
    <component>
      <name>handle</name>
      <information>material</information>
      <description>bone</description>
    </component>
    <component>
      <name>handle</name>
      <information>technique</information>
      <description>carved</description>
    </component>
    <component>
      <name>blade</name>
      <information>material</information>
      <description>steel</description>
    </component>
  </description>
</object>
```