

Converting object documentation into a CRM-compatible XML form using Data Junction 7.5

(DOC to XML conversion):

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The purpose of this project was to convert a structured text file with museum documentation data automatically into an XML file, which is compatible with the CIDOC Conceptual Reference Model version 3.0 and a DTD for this model (see below).

For the implementation of this conversion we used Data Junction 7.5. As source file in this conversion we used a set of sample object documentation records in .doc format, provided to us by Dr. Ann Elizabeth Borda, Head of Collections Multimedia of the Science Museum, London SW7 2DD to test the CRM model. An example of the input data is shown below:

ID	1975-7309		
Category	NRM - Railway furniture		
Description	Armchair, Upholstered in blue moquette with curved, buttoned back & scroll arms. Wooden legs		
Item name(s)	armchairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
Overall	physical descriptor	upholstering	Processes & techniques
Overall	material	moquette	Materials
Overall	colour	blue	Color
Legs	material	wood	Materials
Back	physical descriptor	buttoning	Processes & techniques
Back	shape	curved	Physical attributes
Arms	shape	scrolled arms	Components

Every item in the DataIndex.doc source file is divided into two parts. The first part describes the item generally, its ID, Category, Description and Item's name. The second part describes the parts of the item using the categories Part, Aspect, Term and AAT Hierarchy. In the second part one can describe some characteristics of the overall item or some parts of the item like the legs, the back, the arms etc of furniture.

Below the mapping from the first part of the item to the CIDOC CRM:

<u>Item's Field</u>		<u>CIDOC</u>
ID	→	is identified by
Category	→	has type
Description	→	has note
Item Name(s)	→	has type

Additionally, the Item Name(s) field "is_part_of" an AAT Hierarchy, which belongs to the class "Authority Document" in the CIDOC Conceptual Reference Model.

Now, in the second part of the source file we first check if the part, which is described, is an overall part of the item or a specific part of the item. If it is a specific part of the item we use the element “contains”. For example, the above item contains the “1975-7309 Legs”, the “1975-7309 Back” and the “1975-7309 Arms”.

Then, according to the Aspect of the part we use the below mapping:

<u>Aspect</u>		<u>CIDOC</u>
Physical descriptor	→	used general technique
Material	→	consists of
Color, Shape	→	has note

I.e. "color" and "shape" are no specific attributes of the CRM. They are therefore kept as text. Any application needing it may extend the CRM by such concepts. Both would belong the class "Type".

The “Term” field is the value of the above elements and the “(AAT Hierarchy)” field is converted to the “is_part_of” element.

According to this mapping, we see below how the above example is finally converted to the CIDOC Conceptual Reference Model.

```
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    <has_note>colour,blue, AAT Hierarchy: Color </has_note>
    <has_note>Armchair, Upholstered in blue moquette with curved,
      buttoned back & scroll arms. Wooden legs</has_note>
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      <in_class>Man Made Object Type</in_class></has_type>
    <has_type>armchairs
      <in_class>Man Made Object Type</in_class>
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        <in_class>Authority Document</in_class>
      </is_part_of></has_type>
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      <is_part_of>AAT Hierarchy :Processes & techniques
        <in_class>Authority Document</in_class>
      </is_part_of>
    </used_general_technique>
    <consists_of>moquette
      <in_class>Material</in_class>
      <is_part_of>AAT Hierarchy :Materials
        <in_class>Authority Document</in_class>
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        <is_part_of>AAT Hierarchy :Materials
          <in_class>Authority Document</in_class>
        </is_part_of></consists_of></contains>
    <contains>1975-7309 back
      <in_class>Man Made Object</in_class>
      <used_general_technique>buttoning
        <is_part_of>AAT Hierarchy :Processes &
          techniques
          <in_class>Authority Document</in_class>
        </is_part_of></used_general_technique>
      <has_note>shape,curved, AAT Hierarchy: Physical
        attributes </has_note></contains>
```

```

    <contains>1975-7309 arms
      <in_class>Man Made Object</in_class>
      <has_note>shape, scrolled arms, AAT Hierarchy:
        Components </has_note></contains>
    </CRM_Entity>
  </CRMset>

```

Below we see the whole source file “DataIndex.doc”, the final target file “DataIndex.xml” and the CIDOC CRM DTD “CRM_Entity.dtd”, on which the final xml file is based on.

DataIndex.doc:

ID	1975-7309		
Category	NRM - Railway furniture		
Description	Armchair, Upholstered in blue moquette with curved, buttoned back & scroll arms. Wooden legs		
Item name(s)	armchairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	physical descriptor	upholstering	Processes & techniques
overall	material	moquette	Materials
overall	colour	blue	Color
legs	material	wood	Materials
back	physical descriptor	buttoning	Processes & techniques
back	shape	curved	Physical attributes
arms	shape	scrolled arms	Components

ID	1988-7334		
Category	NRM - Railway furniture		
Description	Chair, Wooden carver chair with Queen Ann style legs. Prince of Wales feathers carved in back. Oval loose seat embossed brown leather		
Item name(s)	carver chairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	wood	Materials
legs	physical descriptor	Queen Anne Style	Styles & periods
seat	physical descriptor	embossed	Processes & techniques
seat	material	leather	Materials
seat	colour	brown	Color
seat	shape	ovals	Associated concepts

ID	1975-7308		
Category	NRM - Railway furniture		
Description	Carver chair, Oak with oval brocade seat. Prince of Wales crest on back from Royal Saloon of 1876		
Item name(s)	carver chairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	physical descriptor	Victorian	Styles & periods
overall	material	oak	Materials
seat	material	brocade	Materials
seat	shape	ovals	Associated concepts

ID	1986-7803		
Category	NRM - Railway furniture		
Description	Table, Marble topped circular table on three black-painted cast iron legs. From Fishguard Harbour Refreshment Rooms, Great Western Railway, c1910.		
Item name(s)	tables (support furniture) (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
Overall	physical descriptor	three-legged	Attributes & properties
Top	material	marble	Materials
Top	shape	circular	Associated concepts
Legs	physical descriptor	Painted (coated)	Processes & techniques
Legs	material	cast iron	Materials
Legs	colour	black	Color

ID	1984-7077		
Category	NRM - Railway furniture		
Description	Armchair, British Transport Hotels, Wooden legs, back, arms and seat upholstered in mustard cloth		
Item name(s)	armchairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	physical descriptor	upholstering	Processes & techniques
overall	material	cloth	Materials
overall	colour	mustard	Color
legs	material	wood	Materials

ID	1978-7574		
Category	NRM - Railway furniture		
Description	Footstool/Spitton, SE & CR, Brass spitton in mahogany base, mahogany top upholstered in grey & blue, Dimensions: 11" diameter		
Item name(s)	footstools; spittoons (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
base	material	mahogany	Materials
(?)	material	brass	Materials
top	physical descriptor	blue	Color
top	physical descriptor	upholstering	Processes & techniques
top	material	mahogany	Materials
top	colour	gray (color)	Color

ID	1984-7076		
Category	NRM - Railway furniture		
Description	Occasional table, London & North Western Railway, Oval mahogany pedestal table with round under table, probably Edwardian Saloon.		
Item name(s)	occasional tables; pedestal tables (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	mahogany	Materials
overall	physical descriptor	Edwardian	Styles & periods
top	shape	ovals	Associated concepts

ID	1986-7892		
Category	NRM - Railway furniture		
Description	Card Table, Rectangular table with ornately carved legs. Top with leather inlay unfolds to reveal blue baize card table, ex Great Eastern Royal Saloon.		
Item name(s)	card tables (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
top	shape	rectangular	Associated concepts
legs	physical descriptor	carving	Processes & techniques
legs	material	wood	Materials

ID	1986-7826		
Category	NRM - Railway furniture		
Description	Carver Chair, Wooden arms & legs; seat and back upholstered in green leatherette		
Item name(s)	carver chairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
arms	material	wood	Materials
legs	material	wood	Materials
seat	physical descriptor	upholstering	Processes & techniques
seat	material	leather	Materials
seat	colour	green	Color
back	physical descriptor	upholstering	Processes & techniques
back	material	leather	Materials
back	colour	green	Color

ID	1986-7777		
Category	NRM - Railway furniture		
Description	Armchair, Basketry chair covered with blue & gold moquette		
Item name(s)	armchairs; basket chairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	moquette	Materials
overall	colour	blue	Color
overall	colour	gold (color)	Color

ID	1988-7337		
Category	NRM - Railway furniture		
Description	High-backed chair, Lancashire & Yorkshire Railway, high-backed wooden armchair with seat, arms and back panel upholstered in blue moquette, top of back has carved wooden panel with interlocked L & YR, formerly used by CME of LYR at Horwich and later by RM & EE at Derby.		
Item name(s)	armchairs (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	wood	Materials
seat	physical descriptor	upholstering	Processes & techniques
seat	material	moquette	Materials
seat	colour	blue	Color
arms	physical descriptor	upholstering	Processes & techniques
arms	material	moquette	Materials
arms	colour	blue	Color

back	physical descriptor	upholstering	Processes & techniques
back	physical descriptor	carving	Processes & techniques
back	material	moquette	Materials
back	colour	blue	Color

ID	1986-7946		
Category	NRM - Railway furniture		
Description	Station Seat, wooden bench with cast iron arms and three cast iron supports, knobbled log design, painted brown.		
Item name(s)	benches (AAT Hierarchy: Furnishings)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	wood	Materials
arms	material	cast iron	Materials
supports	physical descriptor	painted (coated)	Processes & techniques
supports	material	cast iron	Materials
supports	colour	brown	Color

ID	1975-7530		
Category	NRM - Railway timepieces		
Description	Timepiece, Newcastle & Berwick Rly, No 3ND Reid & Sons, Newcastle Guard's timepiece, rectangular brass and mahogany case. Circular face with Roman numerals. 2 1/2"x1 1/4"x3 1/4"		
Item name(s)	Timepiece (AAT Hierarchy: Measuring devices)		
Part	Aspect	Term	(AAT Hierarchy)
case	material	brass (alloy)	Materials
case	material	mahogany	Materials
case	shape	rectangular	Associated concepts
face	shape	circular	Associated concepts
numerals	physical descriptor	Roman numerals	Components

ID	1978-8086		
Category	NRM - Railway timepieces		
Description	Pocket watch with leather fob, silver, Roman face "Harris Stone, Leeds Non Magnetic".		
Item name(s)	Pocket watch (AAT Hierarchy: Measuring devices)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	silver	Materials
fob	material	leather	Materials
numerals	physical descriptor	Roman numerals	components

ID	1984-7507		
Category	NRM - Railway timepieces		
Description	Wall Clock (long-cased), Roman face, wooden case (painted pale blue)		

Item name(s)	Wall clock (AAT Hierarchy: Measuring devices)		
Part	Aspect	Term	(AAT Hierarchy)
numerals	physical descriptor	Roman numerals	Components
case	physical descriptor	painted (coated)	Processes & techniques
case	material	wood	Materials
case	colour	pale blue	Color

ID	1976-8071		
Category	NRM - Railway timepieces		
Description	Pocket Watch, East & West Yorkshire Union Rly, steel Arabic numerals in red, by Medana. On reverse "E & WYUR 1413" (minute hand detached).		
Item name(s)	Pocket watch (AAT Hierarchy: Measuring devices)		
Part	Aspect	Term	(AAT Hierarchy)
overall	material	steel	Materials
numerals	physical descriptor	Arabic numerals	Components
numerals	colour	red	Color

DataIndex.xml:

```

<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE CRMset SYSTEM "test.dtd">
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    <has_note>colour,blue,
    AAT Hierarchy: Color </has_note>
    <has_note>Armchair, Upholstered in blue
    moquette with curved, buttoned back & scroll arms. Wooden
    legs
    </has_note>
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    Object
    Type</in_class>
    </has_type>
    <has_type>armchairs <in_class>Man Made Object
    Type</in_class>
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  </is_part_of>
  </has_type>
  <used_general_technique>upholstering
  <is_part_of>AAT Hierarchy :Processes & techniques
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Document</in_class>
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    </consists_of>
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Document</in_class>
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Document</in_class>
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    </used_general_technique>
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AAT Hierarchy: Physical attributes </has_note>
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Object</in_class>
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feathers carved
in back. Oval loose seat embossed brown leather </has_note>
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Railway furniture <in_class>Man Made Object
Type</in_class>
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Type</in_class>
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Document</in_class>
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    </consists_of>
    <contains>1988-7334 legs
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<in_class>Authority
Document</in_class>
    </is_part_of>

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    </contains>
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    Document</in_class>
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    Saloon of 1876 </has_note>
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Hierarchy: Associated concepts
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Made
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Marble topped circular table on three black-painted cast iron
legs. From
Fishguard Harbour Refreshment Rooms, Great Western Railway,
c1910.
    </has_note>
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Object
Type</in_class>
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Type</in_class>
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Furnishings
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Document</in_class>
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    </has_type>
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<in_class>Authority
Document</in_class>
    </is_part_of>
    </used_general_technique>
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top <in_class>Man Made Object</in_class>
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<in_class>Material</in_class>
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Document</in_class>
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Hierarchy: Associated concepts </has_note>
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<in_class>Man Made Object</in_class>
    <used_general_technique>Painted (coated)
    <is_part_of>AAT Hierarchy :Processes & techniques
<in_class>Authority
Document</in_class>
    </is_part_of>
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Document</in_class>
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Hierarchy: Color </has_note>
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  Wooden legs, back, arms and seat upholstered in mustard cloth
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Object
  Type</in_class>
    </has_type>
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    </is_part_of>
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  Object</in_class>
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    <has_note>Footstool/Spitton,
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  upholstered in grey
    & blue, Dimensions: 11" diameter </has_note>
    <has_type>NRM - Railway
  furniture <in_class>Man Made Object
  Type</in_class>
    </has_type>
    <has_type>footstools; spittoons <in_class>Man Made
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    <is_part_of>AAT Hierarchy: Furnishings
  <in_class>Authority
  Document</in_class>
    </is_part_of>

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        </has_type>
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<in_class>Authority
Document</in_class>
        </is_part_of>
        </consists_of>
    </contains>
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<in_class>Material</in_class>
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<in_class>Authority
Document</in_class>
        </is_part_of>
        </consists_of>
    </contains>
    <contains>1978-7574
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        <used_general_technique>blue
<is_part_of>AAT Hierarchy :Color <in_class>Authority
Document</in_class>
        </is_part_of>
        </used_general_technique>
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    <is_part_of>AAT Hierarchy :Processes & techniques
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Document</in_class>
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        <consists_of>mahogany
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<in_class>Authority
Document</in_class>
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        </consists_of>
        <has_note>colour,gray (color),
AAT Hierarchy: Color </has_note>
    </contains>
</CRM_Entity>
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1984-7076 <in_class>Man Made
Object</in_class>
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table, London & North Western Railway, Oval mahogany
pedestal table with
round under table, probably Edwardian Saloon. </has_note>
        <has_type>NRM -
Railway furniture <in_class>Man Made Object Type
</in_class>
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<in_class>Man Made Object Type </in_class>
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Furnishings <in_class>Authority Document
</in_class>
        </is_part_of>

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        </has_type>
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Made Object</in_class>
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concepts
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Made Object</in_class>
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        <has_note/>
        <has_note>Card Table, Rectangular table
with ornately carved legs. Top with leather inlay unfolds to
reveal blue baize
card table, ex Great Eastern Royal Saloon. </has_note>
        <has_type>NRM - Railway
furniture <in_class>Man Made Object Type</in_class>
</has_type>
        <has_type>card
tables <in_class>Man Made Object Type</in_class>
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Furnishings <in_class>Authority
Document</in_class>
        </is_part_of>
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Associated concepts </has_note>
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        <contains>1986-7892 legs
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Document </in_class>
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</in_class>
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1986-7826 <in_class>Man Made Object </in_class>

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        <is_identified_by>1986-7826
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& legs; seat and back upholstered in green leatherette
    </has_note>
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Object
    Type</in_class>
        </has_type>
        <has_type>carver chairs <in_class>Man Made Object
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        </has_type>
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<in_class>Authority
    Document</in_class>
        </is_part_of>
        </consists_of>
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        <contains>1986-7826
legs <in_class>Man Made Object</in_class>
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Color </has_note>
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    </is_identified_by>
        <has_note>Colour,gold (color), AAT Hierarchy: Color
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        <has_note>Armchair, Basketry chair covered with blue
&amp; gold
    moquette </has_note>
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Object
    Type </in_class>
        </has_type>
        <has_type>armchairs; basket chairs <in_class>Man
Made Object Type </in_class>
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    </in_class>
        </is_part_of>
        </has_type>
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    <in_class>Material</in_class>
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    </is_identified_by>
        <has_note/>
        <has_note>High-backed chair, Lancashire
&amp; Yorkshire Railway, high-backed wooden armchair with
seat, arms and back
    panel upholstered in blue moquette, top of back has carved
wooden panel with
    interlocked L &amp; YR, formerly used by CME of LYR at Horwich
and later by RM
&amp; EE at Derby. </has_note>
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Made Object Type </in_class>
        </has_type>
        <has_type>armchairs <in_class>Man Made
Object Type </in_class>
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    </is_part_of>
    </used_general_technique>
    <consists_of>moquette
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    <is_part_of>AAT Hierarchy :Materials
  <in_class>Authority Document
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    </is_part_of>
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  :Processes & techniques <in_class>Authority Document
  </in_class>
    </is_part_of>
    </used_general_technique>
    <consists_of>moquette
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    <is_part_of>AAT Hierarchy :Materials
  <in_class>Authority Document
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  :Processes & techniques <in_class>Authority Document
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    </used_general_technique>
    <used_general_technique>carving
  <is_part_of>AAT Hierarchy :Processes & techniques
<in_class>Authority
  Document </in_class>
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    <consists_of>moquette
  <in_class>Material </in_class>
    <is_part_of>AAT Hierarchy :Materials
  <in_class>Authority Document
  </in_class>
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    <has_note>colour,blue, AAT Hierarchy:

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```

        Color </has_note>
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  <has_note/>
  <has_note>Station Seat, wooden bench
  with cast iron arms and three cast iron supports, knobbed log
  design, painted
  brown. </has_note>
  <has_type>NRM - Railway furniture <in_class>Man Made
Object
  Type </in_class>
  </has_type>
  <has_type>benches <in_class>Man Made Object Type
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  <in_class>Man Made Object </in_class>
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  <has_note/>

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```

        <has_note>Timepiece, Newcastle &
        Berwick Rly, No 3ND Re & Sons, Newcastle Guard&apos;s
timepiece,
        rectangular brass and mahogany case. Circular face with Roman
numerals. 2
        1/2"x1 1/4"x3 1/ 4" </has_note>
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timepieces <in_class>Man Made Object Type
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<in_class>Material </in_class>
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<in_class>Authority Document
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        </is_part_of>
        </consists_of>
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Hierarchy: Associated concepts </has_note>
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        <has_note>shape, circular, AAT Hierarchy:
Associated concepts </has_note>
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<in_class>Man Made Object </in_class>
        <used_general_technique>Roman numerals
        <is_part_of>AAT Hierarchy :Components <in_class>Authority
Document
</in_class>
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        </contains>
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        1978-8086 <in_class>Man Made Object </in_class>
        <is_identified_by>1978-8086
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        <has_note>Pocket watch with leather
        fob, silver, Roman face &quot;Harris Stone, Leeds Non
Magnetic&quot;.
        </has_note>
        <has_type>NRM - Railway timepieces <in_class>Man Made
Object Type
</in_class>
        </has_type>

```

```

        <has_type>Pocket watch <in_class>Man Made Object Type
    </in_class>
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    Document </in_class>
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        <consists_of>silver
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    Made Object </in_class>
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        <contains>1978-8086 numerals
<in_class>Man Made Object </in_class>
        <used_general_technique>Roman numerals
        <is_part_of>AAT Hierarchy :components <in_class>Authority
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</in_class>
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    Roman face, wooden case (painted pale blue) </has_note>
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    timepieces <in_class>Man Made Object Type </in_class>
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        <has_type>Wall
    clock <in_class>Man Made Object Type </in_class>
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    Hierarchy :Components <in_class>Authority Document
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    case <in_class>Man Made Object </in_class>
        <used_general_technique>painted
    (coated) <is_part_of>AAT Hierarchy :Processes & techniques

```

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Hierarchy: Color </has_note>
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1976-8071 <in_class>Man Made Object </in_class>
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Yorkshire Union Rly, steel Arabic numerals in red, by Medana.
On reverse
    &quot;E & WYUR 1413&quot; (minute hand detached).
</has_note>
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- Railway timepieces <in_class>Man Made Object Type
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assigned |  
assigns |  
associated_with |  
at_least_covering |  
at_most_within |  
bears_feature |  
begins_at |  
begins_at_qualify |  
belongs_to |  
brought_into_existence |  
brought_into_life |  
carried_out_by |  
changed_ownership_by |  
classified |  
concerns |  
condition_of |  
consists_of |  
contains |  
currently_holds |  
custody_changed_by |  
custody_received_by |  
custody_surrendered_by |  
deassigns |  
defines_section |  
depicts_concept |  
depicts_event |  
depicts_object |  
destroyed |  
died_in |  
dissolved |  
documents |  
ends_at |  
ends_at_qualify |  
falls_within |  
forms_part_of |  
from_father |  
had_as_general_purpose |  
had_as_general_use |  
had_at_least_duration |  
had_at_most_duration |  
had_member |  
had_participants |  
had_specific_purpose |  
has_condition |  
has_contact_points |  
has_created |  
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has_current_location |  
has_current_or_former_residence |  
has_current_owner |  
has_current_permanent_location |  
has_dimension |  
has_formed |  
has_former_current_keeper |  
has_former_current_location |  
has_former_current_owner |  
has_gender |  
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has_note |
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identified_by |
identifies |
is_assigned_by |
is_called |
is_composed_of |
is_current_or_former_residence_of |
is_current_owner_of |
is_current_permanent_location_of |
is_deassigned_by |
is_depicted_by |
is_dimension_of |
is_documented_in |
is_former_current_keeper_of |
is_former_current_location_of |
is_former_current_owner_of |
is_found_on |
is_gender_of |
is_identified_by |
is_incorporated_in |
is_language_of |
is_located_on_or_within |
is_part_of |
is_possessed_by |
is_preferred_identifier_of |
is_referred_to_by |
is_shown_by |
is_subject_to |
is_time-span_of |
is_title_of |
is_translation_of |
is_type_of |
is_usually_employed_by |
measured |
motivated |
motivated_the_creation_of |
moved |
moved_by |
moved_from |
moved_to |
observed_dimension |
occupied |
occurred_in_the_presence_of |
owns_rights_to |
participated_in |
performed |
possesses |
preferred_identifier_is |
provides_access_to |
received_custody |
refers_to |
refers_to_concept |
registered_by |
registers |
right_held_by |

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shows_visual_item |
surrendered_custody |
surrendered_title_of |
took_into_account |
took_out_of_existence |
took_place_at |
took_place_on_or_within |
transferred_custody_of |
transferred_title_from |
transferred_title_of |
transferred_title_to |
unit |
used_general_technique |
used_object |
used_specific_technique |
usually_employs |
vacated |
value |
was_assigned_by |
was_born |
was_brought_into_existence_by |
was_classified_by |
was_created_by |
was_created_for |
was_death_of |
was_destroyed_by |
was_dissolved_by |
was_father_for |
was_formed_by |
was_intended_for |
was_intended_use_of |
was_intention_of |
was_made_for |
was_measured |
was_member_of |
was_motivation_for |
was_observed |
was_present_at |
was_produced_by |
was_purpose_of |
was_taken_into_account_by |
was_taken_out_of_existence_by |
was_technique_of |
was_use_of |
was_used_by |
was_used_for |
witnessed )*)">

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<!ELEMENT associated_with (%ATTRIB;)>
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<!ELEMENT at_most_within (begins_at,ends_at)>
<!ELEMENT bears_feature (%ATTRIB;)>
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<!ELEMENT has_current_permanent_location (%ATTRIB;)>
<!ELEMENT has_current_or_former_residence (%ATTRIB;)>
<!ELEMENT has_dimension (%ATTRIB;)>
<!ELEMENT has_former_current_keeper (%ATTRIB;)>
<!ELEMENT has_former_current_location (%ATTRIB;)>
<!ELEMENT has_former_current_owner (%ATTRIB;)>
<!ELEMENT has_formed (%ATTRIB;)>
<!ELEMENT has_gender (%ATTRIB;)>
<!ELEMENT has_identified (%ATTRIB;)>
<!ELEMENT has_language (%ATTRIB;)>
<!ELEMENT has_note (#PCDATA)>
<!ELEMENT has_number_of_parts (#PCDATA)>
<!ELEMENT has_produced (%ATTRIB;)>
<!ELEMENT has_right_on (%ATTRIB;)>
<!ELEMENT has_section_definition (%ATTRIB;)>
<!ELEMENT has_section (%ATTRIB;)>
<!ELEMENT has_time-span (%ATTRIB;)>
<!ELEMENT has_title (%ATTRIB;)>
<!ELEMENT has_translation (%ATTRIB;)>
<!ELEMENT has_type (%ATTRIB;)>
<!ELEMENT identified_by (%ATTRIB;)>
<!ELEMENT identifies (%ATTRIB;)>
<!ELEMENT is_assigned_by (%ATTRIB;)>
<!ELEMENT is_called (%ATTRIB;)>

<!ELEMENT is_composed_of (%ATTRIB;)>
<!ELEMENT is_current_owner_of (%ATTRIB;)>
<!ELEMENT is_current_permanent_location_of (%ATTRIB;)>
<!ELEMENT is_current_or_former_residence_of (%ATTRIB;)>
<!ELEMENT is_deassigned_by (%ATTRIB;)>
<!ELEMENT is_depicted_by (%ATTRIB;)>
<!ELEMENT is_dimension_of (%ATTRIB;)>
<!ELEMENT is_documented_in (%ATTRIB;)>
<!ELEMENT is_former_current_keeper_of (%ATTRIB;)>
<!ELEMENT is_former_current_location_of (%ATTRIB;)>
<!ELEMENT is_former_current_owner_of (%ATTRIB;)>
<!ELEMENT is_found_on (%ATTRIB;)>
<!ELEMENT is_gender_of (%ATTRIB;)>
<!ELEMENT is_identified_by (%ATTRIB;)>
<!ELEMENT is_incorporated_in (%ATTRIB;)>
<!ELEMENT is_language_of (%ATTRIB;)>
<!ELEMENT is_located_on_or_within (%ATTRIB;)>
<!ELEMENT is_part_of (%ATTRIB;)>
<!ELEMENT is_possessed_by (%ATTRIB;)>
<!ELEMENT is_preferred_identifier_of (%ATTRIB;)>
<!ELEMENT is_referred_to_by (%ATTRIB;)>
<!ELEMENT is_shown_by (%ATTRIB;)>
<!ELEMENT is_subject_to (%ATTRIB;)>
<!ELEMENT is_time-span_of (%ATTRIB;)>
<!ELEMENT is_title_of (%ATTRIB;)>
<!ELEMENT is_translation_of (%ATTRIB;)>
<!ELEMENT is_type_of (%ATTRIB;)>
<!ELEMENT is_usually_employed_by (%ATTRIB;)>
<!ELEMENT measured (%ATTRIB;)>
<!ELEMENT motivated_the_creation_of (%ATTRIB;)>
<!ELEMENT motivated (%ATTRIB;)>
<!ELEMENT moved (%ATTRIB;)>
<!ELEMENT moved_by (%ATTRIB;)>
<!ELEMENT moved_from (%ATTRIB;)>
<!ELEMENT moved_to (%ATTRIB;)>
<!ELEMENT observed_dimension (%ATTRIB;)>
<!ELEMENT occupied (%ATTRIB;)>
<!ELEMENT occurred_in_the_presence_of (%ATTRIB;)>
<!ELEMENT owns_rights_to (%ATTRIB;)>
<!ELEMENT participated_in (%ATTRIB;)>
<!ELEMENT performed (%ATTRIB;)>
<!ELEMENT possesses (%ATTRIB;)>
<!ELEMENT preferred_identifier_is (%ATTRIB;)>
<!ELEMENT provides_access_to (%ATTRIB;)>
<!ELEMENT received_custody (%ATTRIB;)>
<!ELEMENT refers_to (%ATTRIB;)>
<!ELEMENT refers_to_concept (%ATTRIB;)>
<!ELEMENT registers (%ATTRIB;)>
<!ELEMENT registered_by (%ATTRIB;)>
<!ELEMENT right_held_by (%ATTRIB;)>
<!ELEMENT shows_visual_item (%ATTRIB;)>
<!ELEMENT surrendered_custody (%ATTRIB;)>
<!ELEMENT surrendered_title_of (%ATTRIB;)>
<!ELEMENT took_into_account (%ATTRIB;)>
<!ELEMENT took_out_of_existence (%ATTRIB;)>
<!ELEMENT took_place_at (%ATTRIB;)>
<!ELEMENT took_place_on_or_within (%ATTRIB;)>
<!ELEMENT transferred_custody_of (%ATTRIB;)>
<!ELEMENT transferred_title_from (%ATTRIB;)>
<!ELEMENT transferred_title_of (%ATTRIB;)>
<!ELEMENT transferred_title_to (%ATTRIB;)>
<!ELEMENT unit (%ATTRIB;)>
<!ELEMENT used_general_technique (%ATTRIB;)>
<!ELEMENT used_object (%ATTRIB;)>

<!ELEMENT used_specific_technique (%ATTRIB;)>
<!ELEMENT usually_employs (%ATTRIB;)>
<!ELEMENT vacated (%ATTRIB;)>
<!ELEMENT value (#PCDATA)>
<!ELEMENT was_assigned_by (%ATTRIB;)>
<!ELEMENT was_born (%ATTRIB;)>
<!ELEMENT was_brought_into_existence_by (%ATTRIB;)>
<!ELEMENT was_classified_by (%ATTRIB;)>
<!ELEMENT was_created_by (%ATTRIB;)>
<!ELEMENT was_created_for (%ATTRIB;)>
<!ELEMENT was_destroyed_by (%ATTRIB;)>
<!ELEMENT was_death_of (%ATTRIB;)>
<!ELEMENT was_dissolved_by (%ATTRIB;)>
<!ELEMENT was_father_for (%ATTRIB;)>
<!ELEMENT was_formed_by (%ATTRIB;)>
<!ELEMENT was_intended_for (%ATTRIB;)>
<!ELEMENT was_intention_of (%ATTRIB;)>
<!ELEMENT was_intended_use_of (%ATTRIB;)>
<!ELEMENT was_made_for (%ATTRIB;)>
<!ELEMENT was_measured (%ATTRIB;)>
<!ELEMENT was_member_of (%ATTRIB;)>
<!ELEMENT was_motivation_for (%ATTRIB;)>
<!ELEMENT was_observed (%ATTRIB;)>
<!ELEMENT was_produced_by (%ATTRIB;)>
<!ELEMENT was_present_at (%ATTRIB;)>
<!ELEMENT was_purpose_of (%ATTRIB;)>
<!ELEMENT was_taken_out_of_existence_by (%ATTRIB;)>
<!ELEMENT was_taken_into_account_by (%ATTRIB;)>
<!ELEMENT was_technique_of (%ATTRIB;)>
<!ELEMENT was_use_of (%ATTRIB;)>
<!ELEMENT was_used_for (%ATTRIB;)>
<!ELEMENT was_used_by (%ATTRIB;)>
<!ELEMENT witnessed (%ATTRIB;)>