

Mapping Linked Art (linked.art) to Schema.org

Craig Parry & Jon Sykora

Project Proposal

We gained inspiration for our project from the Georgia O'keeffe museum, which uses the Linked Art (linked.art) model to annotate their web data. Our project focused on building a mapping from Linked.art to Schema.org in an effort to help extend the reach of data that has implemented annotations with the Linked.art model.

To reach our goal we need to complete the following steps:

1. Research a current mapping of linked.art to schema.org
2. Describe and document a mapping of linked.art to schema.org (if necessary)
3. Build a demo to map a sample of semantically annotated data from Okeeffe Museum to schema.org annotations
4. Extend the demo to all labels categorized by linked.art that have a mapping in schema.org

Linked.art

- **Community project**
- Linked Open Usable Data (LOUD) principles
- JSON-LD for usability with developers and ontological constructs built into the JSON structure

Linked.art

- Community project
- **Linked Open Usable Data (LOUD) principles**
 - **Should be understandable, easy to use, and express schema without the need for users to fully understand ontologies and theoretical semantics**
- JSON-LD for usability with developers and ontological constructs built into the JSON structure

Linked.art

- Community project
- Linked Open Usable Data principles
- **JSON-LD for usability with developers and ontological constructs built into the JSON structure**

Linked Art VisualItem JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://linked.art/example/VisualItem/0",
  "type": "VisualItem",
  "_label": "Appearance of Miro's The Farm",
  "classified_as": [
    {
      "id": "http://vocab.getty.edu/aat/300021495",
      "type": "Type",
      "_label": "Cubist",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300015646",
          "type": "Type",
          "_label": "Style"
        }
      ]
    },
    "identified_by": [
      {
        "type": "Name",
        "content": "Appearance of The Farm"
      }
    ],
    "referred_to_by": [
      {
        "type": "LinguisticObject",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300435416",
            "type": "Type",
            "_label": "Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
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        ],
        "content": "A brilliant amalgamation of an intense, even primitive, realism
with the formal vocabulary of cubism."
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    ],
    "represents_instance_of_type": [
      {
        "id": "http://vocab.getty.edu/aat/300132410",
        "type": "Type",
        "_label": "Tree"
      }
    ],
    "shown_by": [
      {
        "id": "https://www.nga.gov/collection/art-object-page.69660.html",
        "type": "HumanMadeObject",
        "_label": "The Farm"
      }
    ],
    "created_by": {
      "type": "Creation",
      "timespan": {
        "type": "TimeSpan",
        "_label": "1921-1922",
        "begin_of_the_begin": "1921-01-01T00:00:00Z",
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      }
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    "carried_out_by": [
      {
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        "type": "Person",
        "_label": "Juan Miro"
      }
    ],
    "represents": [
      {
        "id": "http://vocab.getty.edu/tgn/7300934",
        "type": "Place",
        "_label": "Mont-roig del Camp"
      }
    ]
  }
}
```

Schema.org

- **Collaborative effort by Google, Microsoft and Yandex**
- Philosophy of the project is to annotate as much web data as possible
- Hierarchical design where every type described is a child of “Thing”
- Schema described with ontologies and theoretical semantic correctness

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Types:

[Close hierarchy](#) / [Open hierarchy](#)

▼ Thing -

► Action +

▼ CreativeWork -

- AmpStory
- ArchiveComponent
- Article +
- Atlas
- Blog
- Book +
-
- SoftwareSourceCode
- SpecialAnnouncement
- TVSeason
- TVsSeries
- Thesis

▼ VisualArtwork -

► CoverArt +

- WebContent +
- WebPage +
- WebPageElement +
- WebSite

► Event +

Thing

A Schema.org Type

Thing

[more...]

The most generic type of item.

Property	Expected Type	Description
Properties from Thing		
<code>additionalType</code>	URL	An additional type for the item, typically used for adding more specific types from external vocabularies in microdata syntax. This is a relationship between something and a class that the thing is in. In RDFa syntax, it is better to use the native RDFa syntax - the 'typeof' attribute - for multiple types. Schema.org tools may have only weaker understanding of extra types, in particular those defined externally.
<code>alternateName</code>	Text	An alias for the item.
<code>description</code>	Text	A description of the item.
<code>disambiguatingDescription</code>	Text	A sub property of description. A short description of the item used to disambiguate from other, similar items. Information from other properties (in particular, name) may be necessary for the description to be useful for disambiguation.
<code>identifier</code>	PropertyValue or Text or URL	The identifier property represents any kind of identifier for any kind of Thing , such as ISBNs, GTIN codes, UUIDs etc. Schema.org provides dedicated properties for representing many of these, either as textual strings or as URL (URI) links. See background notes for more details.
<code>image</code>	ImageObject or URL	An image of the item. This can be a URL or a fully described ImageObject .
<code>mainEntityOfPage</code>	CreativeWork or URL	Indicates a page (or other CreativeWork) for which this thing is the main entity being described. See background notes for details. Inverse property: mainEntity
<code>name</code>	Text	The name of the item.
<code>potentialAction</code>	Action	Indicates a potential Action, which describes an idealized action in which this thing would play an 'object' role.
<code>sameAs</code>	URL	URL of a reference Web page that unambiguously indicates the item's identity. E.g. the URL of the item's Wikipedia page, Wikidata entry, or official website.
<code>subjectOf</code>	CreativeWork or Event	A CreativeWork or Event about this Thing. Inverse property: about
<code>url</code>	URL	URL of the item.

VisualArtwork

A Schema.org Type

Thing > CreativeWork > VisualArtwork

[more...]

A work of art that is primarily visual in character.

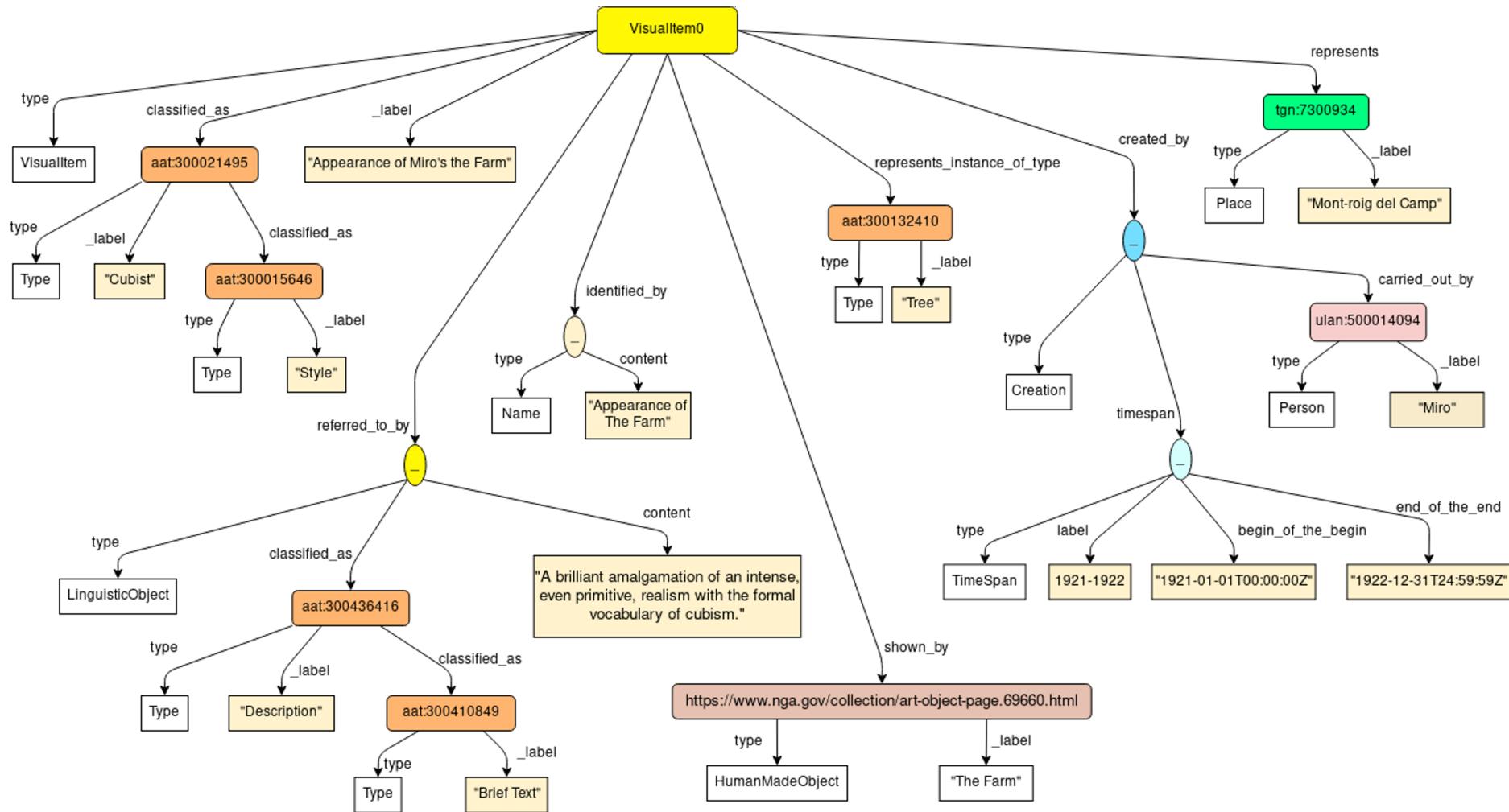
Property	Expected Type	Description
Properties from VisualArtwork		
<code>artEdition</code>	Integer or Text	The number of copies when multiple copies of a piece of artwork are produced - e.g. for a limited edition of 20 prints, 'artEdition' refers to the total number of copies (in this example "20").
<code>artMedium</code>	Text or URL	The material used. (e.g. Oil, Watercolour, Acrylic, Linoprint, Marble, Cyanotype, Digital, Lithograph, DryPoint, Intaglio, Pastel, Woodcut, Pencil, Mixed Media, etc.)
<code>artform</code>	Text or URL	e.g. Painting, Drawing, Sculpture, Print, Photograph, Assemblage, Collage, etc.
<code>artist</code>	Person	The primary artist for a work in a medium other than pencils or digital line art--for example, if the primary artwork is done in watercolors or digital paints.
<code>artworkSurface</code>	Text or URL	The supporting materials for the artwork, e.g. Canvas, Paper, Wood, Board, etc. Supersedes <code>surface</code> .
<code>colorist</code>	Person	The individual who adds color to inked drawings.
<code>depth</code>	Distance or QuantitativeValue	The depth of the item.
<code>height</code>	Distance or QuantitativeValue	The height of the item.
<code>inker</code>	Person	The individual who traces over the pencil drawings in ink after pencils are complete.
<code>letterer</code>	Person	The individual who adds lettering, including speech balloons and sound effects, to artwork.
<code>penciler</code>	Person	The individual who draws the primary narrative artwork.
<code>width</code>	Distance or QuantitativeValue	The width of the item.

Mapping

- Example of Linked Art's VisualItem mapped to Schema.org's VisualArtwork
- Example of Linked Art's HumanMadeObject mapped to Schema.org's VisualArtwork
- Discuss Linked Art's VisualItem and HumanMadeObject's unique and redundant properties and data

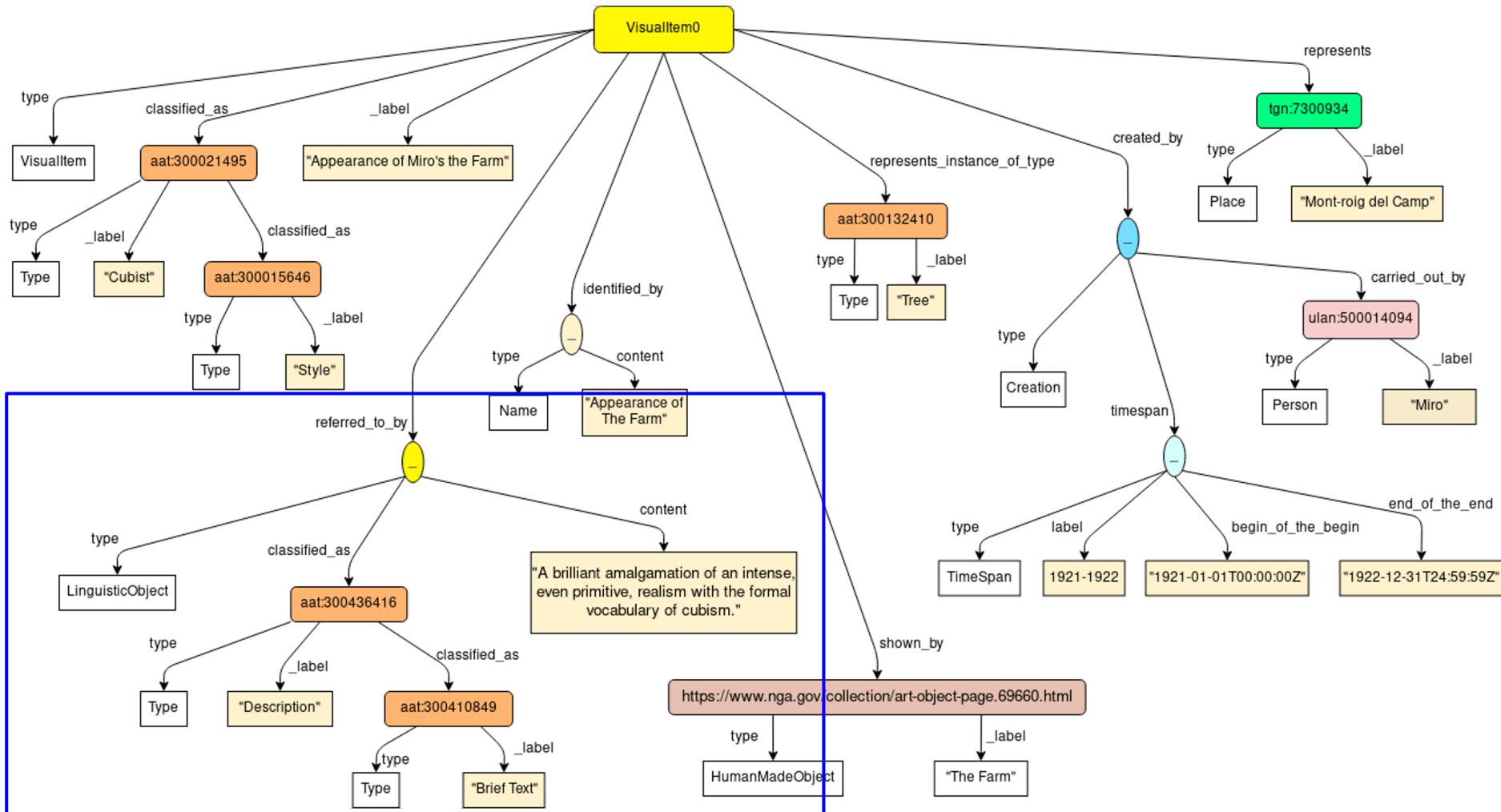
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        }
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        "type": "TimeSpan",
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      }
    ],
    "represents": [
      {
        "id": "http://vocab.getty.edu/tgn/7300934",
        "type": "Place",
        "_label": "Mont-roig del Camp"
      }
    ]
  }
}
```

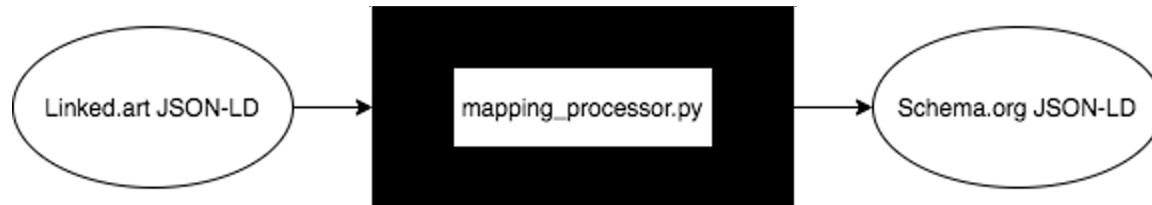


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        "id": "http://vocab.getty.edu/tgn/7300934",
        "type": "Place",
        "_label": "Mont-roig del Camp"
      }
    ]
  ]
}
```



Mapping Processor tool



A command line tool was developed using Python that can take a VisualItem or HumanMadeObject Linked Art JSON-LD file, and produce a VisualArtwork Schema.org JSON-LD file. The following slide contains the content of the Linked.art VisualItem JSON-LD example, and the corresponding mapped file produced.

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```

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  "classified_as": [
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      "id": "http://vocab.getty.edu/aat/300021495",
      "type": "Type",
      "_label": "Cubist",
      "classified_as": [
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      ]
    },
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}

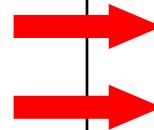
```

Schema.org mapped JSON-LD example

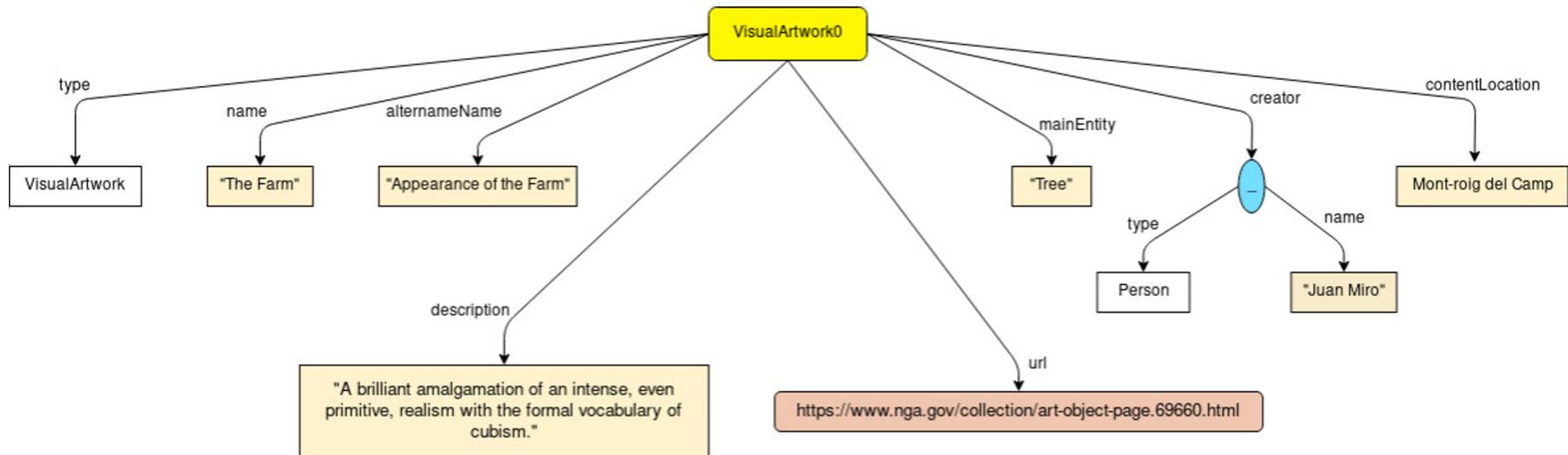
```

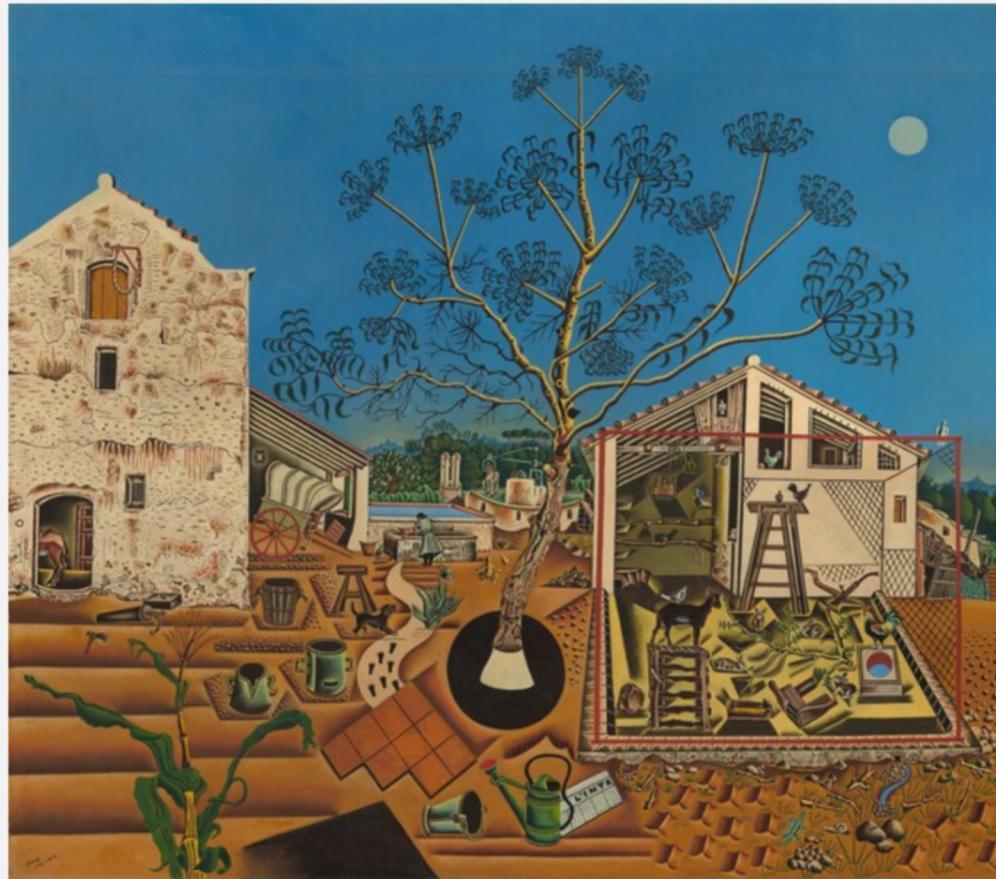
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of the Farm",
  "mainEntity": "Tree",
  "dateCreated": "1922",
  "contentLocation": "Mont-roig del Camp",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism.",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ]
}

```



Schema.org VisualArtwork Mapped Property Diagram





JOAN MIRÓ

The Farm, 1921-1922

📍 Not on View

Medium

oil on canvas

Dimensions

overall: 123.8 x 141.3 x 3.3 cm (48 3/4 x 55 5/8 x 1 5/16 in.)

framed: 138.4 x 155.9 x 7.6 cm (54 1/2 x 61 3/8 x 3 in.)

Credit Line

Gift of Mary Hemingway

Accession Number

1987.18.1

Artists / Makers

Joan Miró (artist) Spanish, 1893 - 1983

Image Use

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[Contact us about image usage](#)

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**Not
Mapped**

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    }
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    "shown_by": [
    {
        "id": "https://www.nga.gov/collection/art-object-page.69660.html",
        "type": "HumanMadeObject",
        "_label": "The Farm"
    }
],
    "created_by": {
        "type": "Creation",
        "timespan": {
            "type": "TimeSpan",
            "_label": "1921-1922",
            "begin_of_the_begin": "1921-01-01T00:00:00Z",
            "end_of_the_end": "1922-12-31T23:59:59Z"
        },
        "carried_out_by": [
        {
            "id": "http://vocab.getty.edu/ulan/500014094",
            "type": "Person",
            "_label": "Juan Miro"
        }
    ],
    "represents": [
    {
        "id": "http://vocab.getty.edu/tgn/7300934",
        "type": "Place",
        "_label": "Mont-roig del Camp"
    }
]
```

Schema.org mapped JSON-LD example

```
<script type="application/ld+json">
{
    "@context": "https://schema.org",
    "@type": "VisualArtwork",
    "name": "The Farm",
    "alternateName": "Appearance of The Farm",
    "creator": [
        {
            "@type": "Person",
            "name": "Juan Miro"
        }
    ],
    "dateCreated": "1922",
    "mainEntity": "Tree",
    "contentLocation": "Mont-roig del Camp",
    "url": "https://www.nga.gov/collection/art-object-page.69660.html",
    "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
}
```

Linked.art VisualItem JSON-LD example

```

        },
        "represents_instance_of_type": [
        {
            "id": "http://vocab.getty.edu/aat/300132410",
            "type": "Type",
            "_label": "Tree"
        }
    ],
    "shown_by": [
    {
        "id": "https://www.nga.gov/collection/art-object-page.69660.html",
        "type": "HumanMadeObject",
        "_label": "The Farm"
    }
],
    "created_by": {
        "type": "Creation",
        "timespan": {
            "type": "TimeSpan",
            "_label": "1921-1922",
            "begin_of_the_begin": "1921-01-01T00:00:00Z",
            "end_of_the_end": "1922-12-31T23:59:59Z"
        },
        "carried_out_by": [
        {
            "id": "http://vocab.getty.edu/ulan/500014094",
            "type": "Person",
            "_label": "Juan Miro"
        }
    ],
    "represents": [
    {
        "id": "http://vocab.getty.edu/tgn/7300934",
        "type": "Place",
        "_label": "Mont-roig del Camp"
    }
]
}

```

Schema.org mapped JSON-LD example

```

<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of The Farm",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "mainEntity": "Tree",
  "contentLocation": "Mont-roig del Camp",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
}

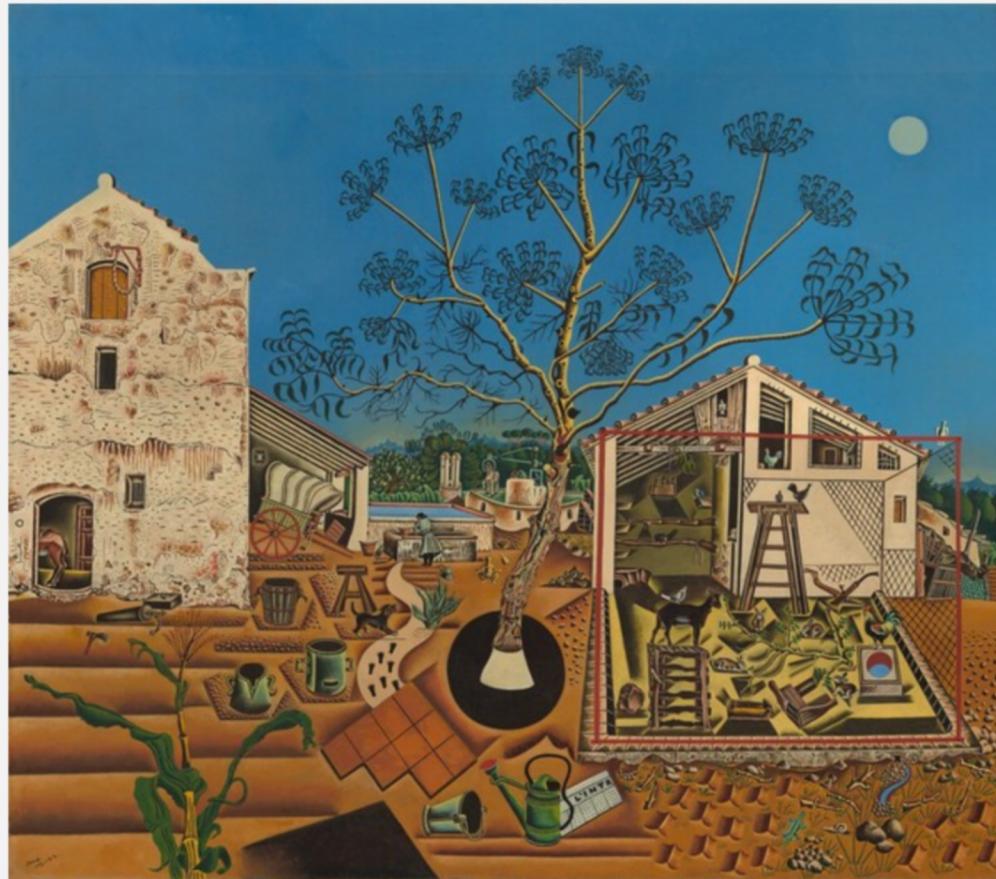
```

Linked.art VisualItem JSON-LD example

```
]
  "represents_instance_of_type": [
    {
      "id": "http://vocab.getty.edu/aat/300132410",
      "type": "Type",
      "_label": "Tree"
    }
  ],
  "shown_by": [
    {
      "id": "https://www.nga.gov/collection/art-object-page.69660.html",
      "type": "HumanMadeObject",
      "_label": "The Farm"
    }
  ],
  "created_by": {
    "type": "Creation",
    "timespan": {
      "type": "TimeSpan",
      "_label": "1921-1922",
      "begin_of_the_begin": "1921-01-01T00:00:00Z",
      "end_of_the_end": "1922-12-31T23:59:59Z"
    },
    "carried_out_by": [
      {
        "id": "http://vocab.getty.edu/ulan/500014094",
        "type": "Person",
        "_label": "Juan Miro"
      }
    ]
  },
  "represents": [
    {
      "id": "http://vocab.getty.edu/tgn/7300934",
      "type": "Place",
      "_label": "Mont-roig del Camp"
    }
  ]
}
```

Schema.org mapped JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of The Farm",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "mainEntity": "Tree",
  "contentLocation": "Mont-roig del Camp",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
}
```



JOAN MIRÓ

The Farm, 1921-1922

📍 Not on View

Medium

oil on canvas

Dimensions

overall: 123.8 x 141.3 x 3.3 cm (48 3/4 x 55 5/8 x 1 5/16 in.)

framed: 138.4 x 155.9 x 7.6 cm (54 1/2 x 61 3/8 x 3 in.)

Credit Line

Gift of Mary Hemingway

Accession Number

1987.18.1

Artists / Makers

Joan Miró (artist) Spanish, 1893 - 1983

Image Use

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[Contact us about image usage](#)

Linked.art VisualItem JSON-LD example

```

        },
        "represents_instance_of_type": [
        {
            "id": "http://vocab.getty.edu/aat/300132410",
            "type": "Type",
            "_label": "Tree"
        }
    ],
    "shown_by": [
    {
        "id": "https://www.nga.gov/collection/art-object-page.69660.html",
        "type": "HumanMadeObject",
        "_label": "The Farm"
    }
],
    "created_by": {
        "type": "Creation",
        "timespan": {
            "type": "TimeSpan",
            "_label": "1921-1922",
            "begin_of_the_begin": "1921-01-01T00:00:00Z",
            "end_of_the_end": "1922-12-31T23:59:59Z"
        }
    },
    "carried_out_by": [
    {
        "id": "http://vocab.getty.edu/ulan/500014094",
        "type": "Person",
        "_label": "Juan Miro"
    }
]
},
    "represents": [
    {
        "id": "http://vocab.getty.edu/tgn/7300934",
        "type": "Place",
        "_label": "Mont-roig del Camp"
    }
]
}

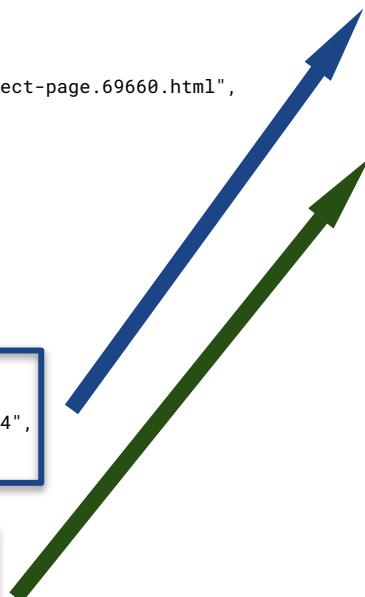
```

Schema.org mapped JSON-LD example

```

<script type="application/ld+json">
{
    "@context": "https://schema.org",
    "@type": "VisualArtwork",
    "name": "The Farm",
    "alternateName": "Appearance of The Farm",
    "creator": [
        {
            "@type": "Person",
            "name": "Juan Miro"
        }
    ],
    "dateCreated": "1922",
    "mainEntity": "Tree",
    "contentLocation": "Mont-roig del Camp",
    "url": "https://www.nga.gov/collection/art-object-page.69660.html",
    "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
}

```



Linked.art HumanMadeObject JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://linked.art/example/object/0",
  "type": "HumanMadeObject",
  "_label": "The Farm",
  "classified_as": [
    {
      "id": "http://vocab.getty.edu/aat/300033618",
      "type": "Type",
      "_label": "Painting",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300435443",
          "type": "Type",
          "_label": "Type of Work"
        }
      ]
    },
    {
      "id": "http://vocab.getty.edu/aat/300133025",
      "type": "Type",
      "_label": "Artwork"
    }
  ],
  "identified_by": [
    {
      "type": "Name",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300404670",
          "type": "Type",
          "_label": "Primary Name"
        }
      ],
      "content": "The Farm",
      "language": [
        {
          "id": "http://vocab.getty.edu/aat/300388277",
          "type": "Language",
          "_label": "English"
        }
      ]
    }
  ],
}
```

Not Mapped

```

    "type": "Identifier",
    "classified_as": [
      {
        "id": "http://vocab.getty.edu/aat/300312355",
        "type": "Type",
        "_label": "Accession Number"
      }
    ],
    "content": "1987.18.1"
  },
  "referred_to_by": [
    {
      "type": "LinguisticObject",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300435416",
          "type": "Type",
          "_label": "Description",
          "classified_as": [
            {
              "id": "http://vocab.getty.edu/aat/300418049",
              "type": "Type",
              "_label": "Brief Text"
            }
          ]
        }
      ],
      "content": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
    },
    "dimension": [
      {
        "type": "Dimension",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300055644",
            "type": "Type",
            "_label": "Height"
          }
        ],
        "value": 123.8,
        "unit": {
          "id": "http://vocab.getty.edu/aat/300379098".
        }
      }
    ]
  ]
}
```

Linked.art HumanMadeObject JSON-LD example

```
"type": "MeasurementUnit",
"_label": "centimeters"
},
{
  "type": "Dimension",
  "classified_as": [
    {
      "id": "http://vocab.getty.edu/aat/300055647",
      "type": "Type",
      "_label": "Width"
    }
  ],
  "value": 141.3,
  "unit": {
    "id": "http://vocab.getty.edu/aat/300379098",
    "type": "MeasurementUnit",
    "_label": "centimeters"
  }
},
"made_of": [
  {
    "id": "http://vocab.getty.edu/aat/300012363",
    "type": "Material",
    "_label": "Canvas"
  },
  {
    "id": "http://vocab.getty.edu/aat/300015050",
    "type": "Material",
    "_label": "Oil Paint"
  }
],
"shows": [
  {
    "id": "https://www.nga.gov/collection/art-object-page.69660.html",
    "type": "VisualItem",
    "_label": "Appearance of the Farm"
  }
],
"current_owner": [
  {
    "id": "https://www.nga.gov/",
    "type": "Group",
    "_label": "National Gallery of Art"
  }
]
```

Not Mapped

```
        }
      ],
      "equivalent": [
        {
          "id": "https://www.wikidata.org/wiki/Q1192436",
          "type": "HumanMadeObject",
          "_label": "The Farm"
        }
      ],
      "produced_by": {
        "type": "Production",
        "timespan": {
          "type": "TimeSpan",
          "identified_by": [
            {
              "type": "Name",
              "classified_as": [
                {
                  "id": "http://vocab.getty.edu/aat/300404669",
                  "type": "Type",
                  "_label": "Display Title"
                }
              ],
              "content": "1921-1922"
            }
          ],
          "begin_of_the_begin": "1921-01-01T00:00:00Z",
          "end_of_the_end": "1922-12-31T23:59:59Z"
        },
        "took_place_at": [
          {
            "id": "http://vocab.getty.edu/tgn/7000457",
            "type": "Place",
            "_label": "Mont-roig del Camp, Spain"
          }
        ],
        "carried_out_by": [
          {
            "id": "http://vocab.getty.edu/ulan/500010879",
            "type": "Person",
            "_label": "Juan Miro"
          }
        ]
      }
    }
  }
]
```

Linked.art HumanMadeObject JSON-LD example

```

<script type="application/ld+json">
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://linked.art/example/object/0",
  "type": "HumanMadeObject",
  "_label": "The Farm",
  "classified_as": [
    {
      "id": "http://vocab.getty.edu/aat/300033618",
      "type": "Type",
      "_label": "Painting",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300435443",
          "type": "Type",
          "_label": "Type of Work"
        }
      ]
    },
    {
      "id": "http://vocab.getty.edu/aat/300133025",
      "type": "Type",
      "_label": "Artwork"
    }
  ],
  "identified_by": [
    {
      "type": "Name",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300404670",
          "type": "Type",
          "_label": "Primary Name"
        }
      ],
      "content": "The Farm",
      "language": [
        {
          "id": "http://vocab.getty.edu/aat/300388277",
          "type": "Language",
          "_label": "English"
        }
      ]
    },
    {
      "type": "Image"
    }
  ],
  "content": "The Farm"
}

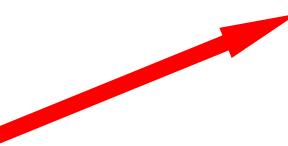
```

Mapped Linked.art HumanMadeObject JSON-LD example

```

<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of the Farm",
  "artForm": "Painting",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "locationCreated": "Mont-roig del Camp, Spain",
  "sameAs": "https://www.wikidata.org/wiki/Q1192436",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism.",
  "height": "123.8 centimeters",
  "width": "141.3 centimeters",
  "artworkSurface": "Canvas",
  "artMedium": "Oil Paint"
}

```



Linked.art HumanMadeObject JSON-LD example

```
"type": "MeasurementUnit",
"_label": "centimeters"
},
{
  "type": "Dimension",
  "classified_as": [
    {
      "id": "http://vocab.getty.edu/aat/300055647",
      "type": "Type",
      "_label": "Width"
    }
  ],
  "value": 141.3,
  "unit": {
    "id": "http://vocab.getty.edu/aat/300379098",
    "type": "MeasurementUnit",
    "_label": "centimeters"
  }
},
"made_of": [
  {
    "id": "http://vocab.getty.edu/aat/300012363",
    "type": "Material",
    "_label": "Canvas"
  },
  {
    "id": "http://vocab.getty.edu/aat/300015050",
    "type": "Material",
    "_label": "Oil Paint"
  }
],
"shows": [
  {
    "id": "https://www.nga.gov/collection/art-object-page.69660.html",
    "type": "VisualItem",
    "_label": "Appearance of the Farm"
  }
],
"current_owner": [
  {
    "id": "https://www.nga.gov/",
    "type": "Group",
    "_label": "National Gallery of Art"
  }
]
```

Mapped Linked.art HumanMadeObject JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of the Farm",
  "artForm": "Painting",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "locationCreated": "Mont-roig del Camp, Spain",
  "sameAs": "https://www.wikidata.org/wiki/Q1192436",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism.",
  "height": "123.8 centimeters",
  "width": "141.3 centimeters",
  "artworkSurface": "Canvas",
  "artMedium": "Oil Paint"
}
```

Linked.art HumanMadeObject JSON-LD example

```

}
],
"equivalent": [
{
  "id": "https://www.wikidata.org/wiki/Q1192436",
  "type": "HumanMadeObject",
  "_label": "The Farm"
}
],
"produced_by": {
  "type": "Production",
  "timespan": {
    "type": "TimeSpan",
    "identified_by": [
      {
        "type": "Name",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300404669",
            "type": "Type",
            "_label": "Display Title"
          }
        ],
        "content": "1921-1922"
      }
    ],
    "begin_of_the_begin": "1921-01-01T00:00:00Z",
    "end_of_the_end": "1922-12-31T23:59:59Z"
  }
},
"took_place_at": [
{
  "id": "http://vocab.getty.edu/tgn/7000457",
  "type": "Place",
  "_label": "Mont-roig del Camp, Spain"
}
],
"carried_out_by": [
{
  "id": "http://vocab.getty.edu/ulan/500010879",
  "type": "Person",
  "_label": "Juan Miro"
}
]
}

```

Mapped Linked.art HumanMadeObject JSON-LD example

```

<script type="application/ld+json">
{
"@context": "https://schema.org",
"@type": "VisualArtwork",
"name": "The Farm",
"alternateName": "Appearance of the Farm",
"artForm": "Painting",
"creator": [
  {
    "@type": "Person",
    "name": "Juan Miro"
  }
],
"dateCreated": "1922",
"locationCreated": "Mont-roig del Camp, Spain",
"sameAs": "https://www.wikidata.org/wiki/Q1192436",
"url": "https://www.nga.gov/collection/art-object-page.69660.html",
"description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism.",
"height": "123.8 centimeters",
"width": "141.3 centimeters",
"artworkSurface": "Canvas",
"artMedium": "Oil Paint"
}

```

HumanMadeObject “equivalent” / schema.org “sameAs”

Wikidata Item Discussion Read View history Search Wikidata

The Farm (Q1192436)

oil painting made by Joan Miró

In more languages Configure

Language	Label	Description	Also known as
English	The Farm	oil painting made by Joan Miró	
Spanish	La masía	pintura de Joan Miró	La masía
Traditional Chinese	No label defined	No description defined	
Chinese	No label defined	No description defined	

All entered languages

Statements

instance of painting

inception 1920s earliest date 1920 latest date 1922

Wikipedia (14 entries) edit

- ca La masia (Miró)
- de Der Bauernhof (Miró)
- en The Farm (Miró)
- eo La Farmo (Miró)
- es La masía (Miró)
- fr La Ferme (Miró)
- gl La masía
- hi ଲା ମସିଆ
- hy Ականալ (Ֆէպ, Միրո)
- it La fattoria (Miró)
- ja 農園 (絵画)
- pa ਲਾਗ੍ਰਾਨਜ਼ (ਮਿਰੋ)
- pt La Granja (Miró)
- ru Ферма (картина Миро)

Wikibooks (0 entries) edit

Wikinews (0 entries) edit

Wikiquote (0 entries) edit

Wikisource (0 entries) edit

Wikiversity (0 entries) edit

VisualItem and HumanMadeObject Unique Properties

Mapped Linked.art VisualItem JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of The Farm",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "mainEntity": "Tree",
  "contentLocation": "Mont-roig del Camp",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive,
realism
  with the formal vocabulary of cubism."
}
```

Unique to
VisualItem

Mapped Linked.art HumanMadeObject JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of the Farm",
  "artForm": "Painting",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "locationCreated": "Mont-roig del Camp, Spain",
  "sameAs": "https://www.wikidata.org/wiki/Q1192436",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive,
realism
  with the formal vocabulary of cubism.",
  "height": "123.8 centimeters",
  "width": "141.3 centimeters",
  "artworkSurface": "Canvas",
  "artMedium": "Oil Paint"
}
```

Unique to
HumanMadeObject

VisualItem and HumanMadeObject Redundancy

```
"created_by": {  
  "type": "Creation",  
  "timespan": {  
    "type": "TimeSpan",  
    "_label": "1921-1922",  
    "begin_of_the_begin": "1921-01-01T00:00:00Z",  
    "end_of_the_end": "1922-12-31T23:59:59Z"  
  },  
  "carried_out_by": [  
    {  
      "id": "http://vocab.getty.edu/ulan/500014094",  
      "type": "Person",  
      "_label": "Juan Miro"  
    }  
  ]  
,  
  "represents": [  
    {  
      "id": "http://vocab.getty.edu/tgn/7300934",  
      "type": "Place",  
      "_label": "Mont-roig del Camp"  
    }  
]
```

```
"produced_by": {  
  "type": "Production",  
  "timespan": {  
    "type": "TimeSpan",  
    "identified_by": [  
      {  
        "type": "Name",  
        "classified_as": [  
          {  
            "id": "http://vocab.getty.edu/aat/300404669",  
            "type": "Type",  
            "_label": "Display Title"  
          }  
        ],  
        "content": "1921-1922"  
      }  
    ],  
    "begin_of_the_begin": "1921-01-01T00:00:00Z",  
    "end_of_the_end": "1922-12-31T23:59:59Z"  
  },  
  "took_place_at": [  
    {  
      "id": "http://vocab.getty.edu/tgn/7000457",  
      "type": "Place",  
      "_label": "Mont-roig del Camp, Spain"  
    }  
],  
  "carried_out_by": [  
    {  
      "id": "http://vocab.getty.edu/ulan/500010879",  
      "type": "Person",  
      "_label": "Juan Miro"  
    }  
  ]  
}
```

VisualItem and HumanMadeObject Redundancy

Mapped Linked.art VisualItem JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of The Farm",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "mainEntity": "Tree",
  "contentLocation": "Mont-roig del Camp",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
}
```

Duplicate or
Redundant Data

Mapped Linked.art HumanMadeObject JSON-LD example

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of the Farm",
  "artForm": "Painting",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "locationCreated": "Mont-roig del Camp, Spain",
  "sameAs": "https://www.wikidata.org/wiki/Q1192436",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism.",
  "height": "123.8 centimeters",
  "width": "141.3 centimeters",
  "artworkSurface": "Canvas",
  "artMedium": "Oil Paint"
}
```

VisualItem & HumanMadeObject Mapped to **Combined** Schema.org JSON-LD

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "VisualArtwork",
  "name": "The Farm",
  "alternateName": "Appearance of The Farm",
  "artForm": "Painting",
  "creator": [
    {
      "@type": "Person",
      "name": "Juan Miro"
    }
  ],
  "dateCreated": "1922",
  "mainEntity": "Tree",
  "contentLocation": "Mont-roig del Camp",
  "locationCreated": "Mont-roig del Camp, Spain",
  "sameAs": "https://www.wikidata.org/wiki/Q1192436",
  "url": "https://www.nga.gov/collection/art-object-page.69660.html",
  "description": "A brilliant amalgamation of an intense, even primitive, realism with the formal vocabulary of cubism."
  "height": "123.8 centimeters",
  "width": "141.3 centimeters",
  "artworkSurface": "Canvas",
  "artMedium": "Oil Paint"
}
```

Using with Georgia O'Keeffe data

These differences must be accounted for:

- The O'Keeffe model uses the type ManMadeObject instead of HumanMadeObject.
- The type-of-types pattern is not used by the O'keeffe model, but this can be ignored.
- The “label” property must be changed to “_label to match the Linked Art model.
- LinguisticObject and Identifier properties must be changed from “value” to “content”.
- Human-readable timespan dates are expressed using the “label” property instead of the identifier (relationship) TimeSpan.

Project Conclusion

- Extension of data model to Schema.org is achievable, but complicated. Involves lots of manual matching types and properties.
- The result emphasizes a need for a standard of structured data across the web.
- We prefer Schema.org's hierarchical design and ease of use, although we lose some expressiveness from Linked Art.

Comments on relational model

- Semantic web uses linked types and properties, foregoing foreign and primary keys.
- The Internet of Things is too massive to create a relational model that encompasses everything.
- Elements of Entity Relational model can help us understand and describe how to structure data.

Questions?