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# Bistìris Ontology: Towards a Structured Representation of Sardinian Traditional Female Costumes

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## Introduction

- Over the past decade there has been a growing trend within the cultural heritage field to **adopt knowledge representation methods and tools of the Semantic Web**, to provide a common base for structuring and managing cultural data.
- **Preserving cultural heritage** is essential for maintaining the richness and diversity of human history. In territories like **Sardinia**, where cultural identity and traditions are deeply rooted, many researchers, museums and communities recognize the importance of safeguarding it for future generations.



## Context & Motivation

- In Sardinia, one significant category of cultural heritage items is represented by **traditional costumes**.
- For their representation, various ontologies are employed, but they are not specifically tailored for traditional costumes. For example, **ArCo** describes them by giving details such as identification codes, location, authorship, materials, conservation status, etc.



## Our Contribution

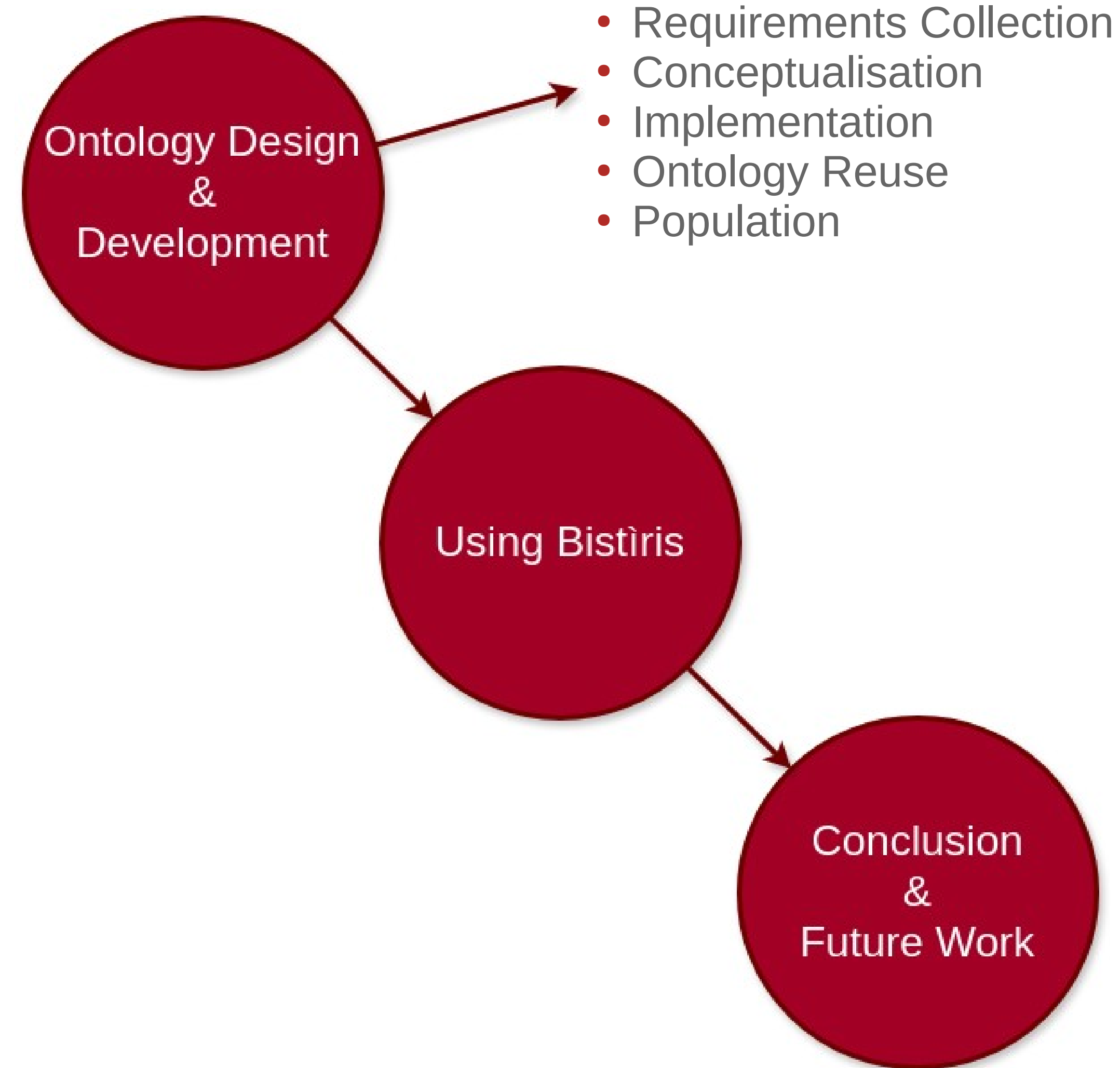
- In this work, we present a new ontology, **Bistiris**, which is designed to capture the intricate variations of the Sardinian traditional female costume. Sardinia, with its rich mosaic of cultural traditions, preserves a wide range of traditional costumes.
- By leveraging an ontology, we can **identify patterns in color, usage and fashion trends**, as well as unexpected relationships between the characteristics of assets and their geographical and cultural origins.
- This allows researchers to **explore the synchronous and diachronic diffusion of parameters of interest**, compare data from various sources and analyze the evolution of costumes over time and across geographical regions.

## Bistiris Ontology

- Variations, which are very common among specimens of the same traditional costume, highlight the significance of **analyzing and comparing** the unique features of each garment.
- Our ontology allows domain experts to conduct **cross-referenced searches** based on the physical characteristics of their objects of study, which are usually not described in detail by other ontologies.
- It serves also as a structured framework for **documenting and preserving** the diverse variations of Sardinian costumes, by providing a semantic representation that includes **geographical** and **temporal properties**.

## Outline

- **Describe the ontology design and development process.**
- **Explore the usage of Bistiris.**
- **Discuss conclusions and future work.**



## Ontology Design & Development - Requirements collection

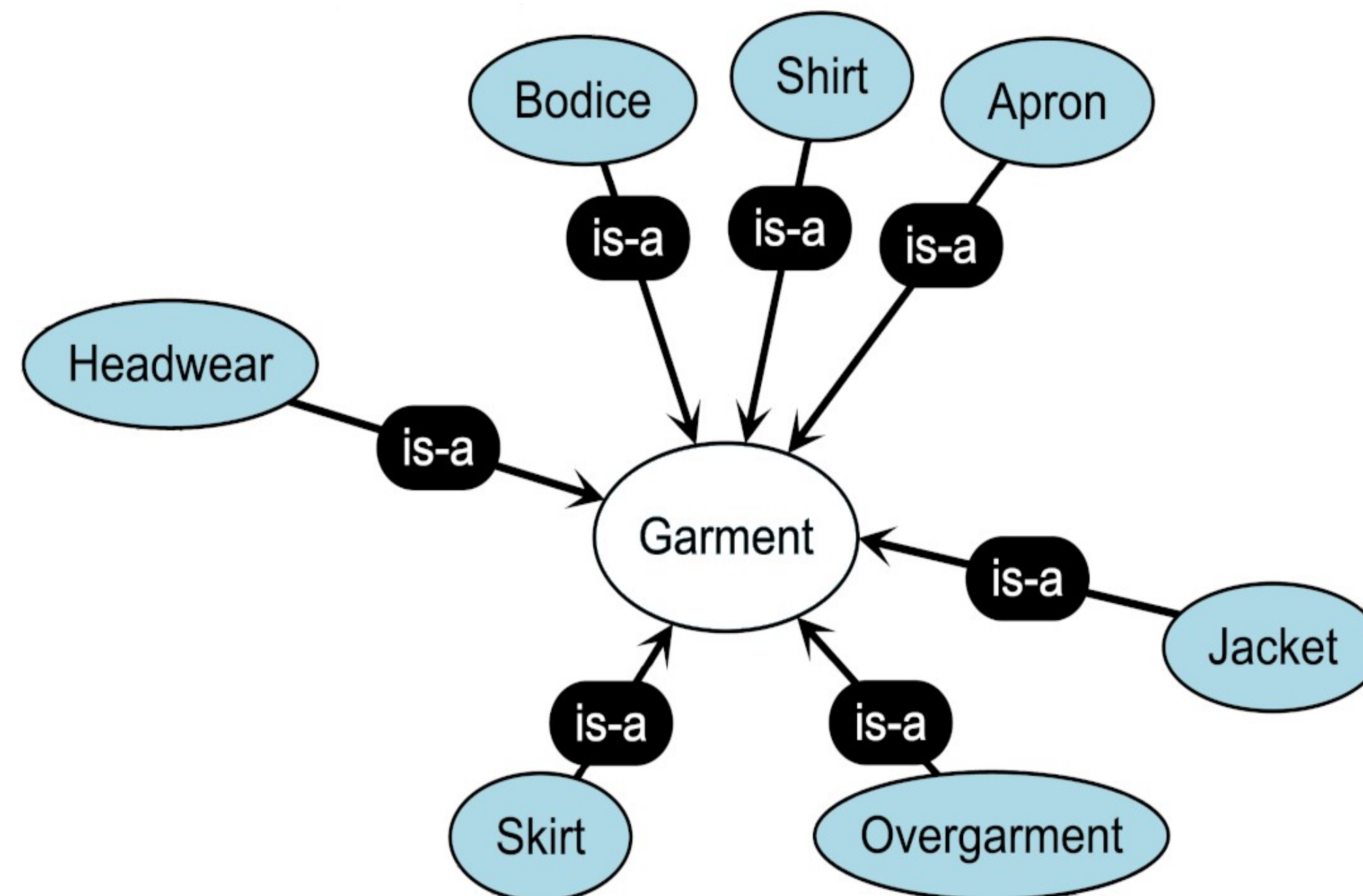
The exploration of traditional Sardinian costumes poses unique challenges:

- A significant **diversity in styles** exhibited by these garments, based on their geographical and cultural origins.
- A plethora of **deviations from traditional norms**, evident in the specimens available today, due to the fact that since the first half of the twentieth century these costumes have ceased to be in regular use.

The initial exploration of **available literature** provided a generic description of each traditional garment. After that, to collecting detailed information about the costumes we had to resort to **examination of photographs and illustrations** sourced from books, manuals, and cultural institutional sites.

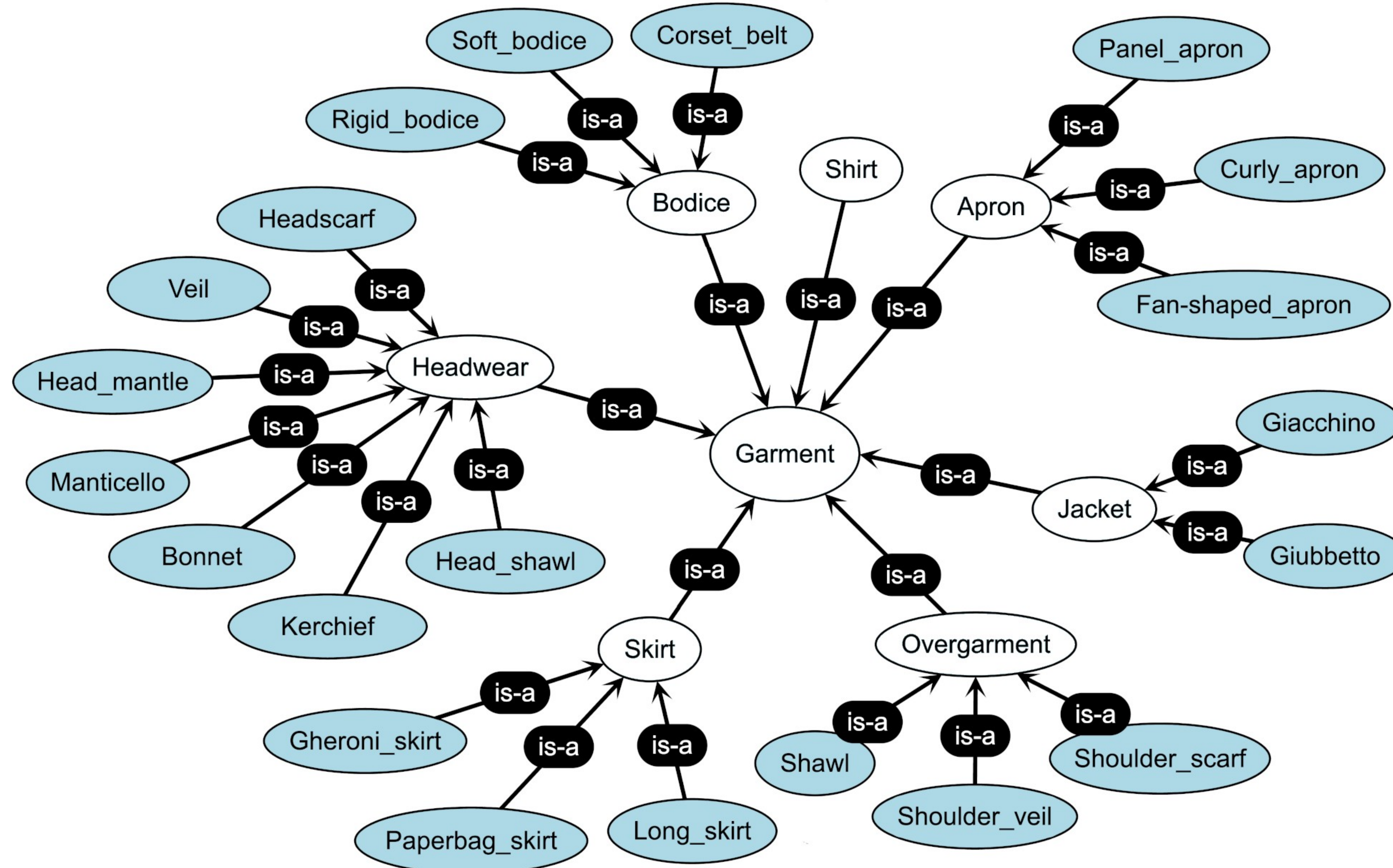
## Conceptualisation

Initially, a bottom-up approach to designing the taxonomy of concepts, starting from individual garments and progressing to costumes, appeared promising. However, the extensive diversity of garment types uncovered in preliminary domain research prompted a shift to the **middle-out approach**. This approach centered the ontology design around **seven core classes**:



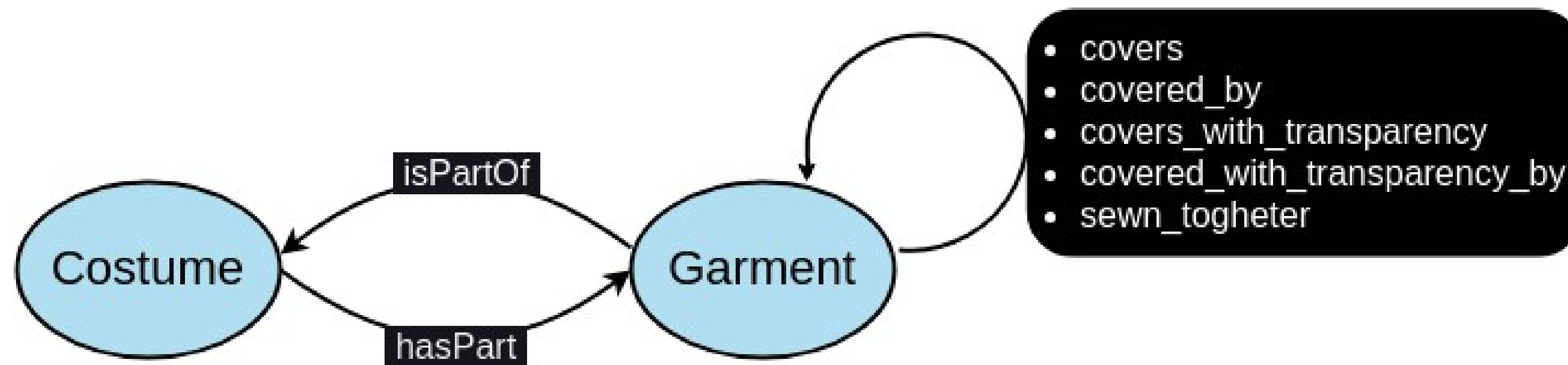


These core classes further branch into **21 more specialised sub-classes**:



## Implementation: Object properties

Some relevant object properties has been developed to delineate the **relationships among the garments**. These relationships facilitate the identification of garments that are fully visible when the costume is worn completely, and those that are partially or nearly entirely covered.



## Implementation: Data Properties

Concerning data properties, individuals belonging to the `:Garment` class can be described using **28 data properties**. The majority of them accept a datatype `xsd:boolean` as their range. The remaining properties, which describe the colors of garments and accessories, accept a datatype `rdfs:Literal` as their range.

Most data properties represent characteristics of one or two sub-classes of the `:Garment` class. An illustrative example of certain restrictions on the `:Panel_aprons` class through OWL axioms is reported below, formalized in Manchester Syntax notation:

```
Panel_aprons and  
((elongated_strip value true) or (tongue_shaped value true) or  
(triangle_shaped value true)) and (apron_panel value true)
```

## Ontology reuse

To enhance ontology interoperability and reusability, we established connections with various external ontologies through direct reusing strategies, integrating ontology terms from three prominent sources: **DBpedia**, **Dublin Core**, and **Schema.org**.

Element	Type	Ontology	Usage
source	Property	Dublin Core	A related resource from which the costume is derived.
isPartOf	Property	Schema.org	A particular garment is part of or belongs to a costume.
hasPart	Property	Schema.org	A costume comprises or includes specific garments as its parts.
fromLocation	Property	Schema.org	The geographical origin or location associated with a particular garment or costume.
dateCreated	Property	Schema.org	The date or period when a particular garment or costume was created.
Place	Class	DBpedia	It denotes physical places, such as cities, countries, regions, landmarks, or geographical areas.

## Population

The ontology was populated from three primary sources:

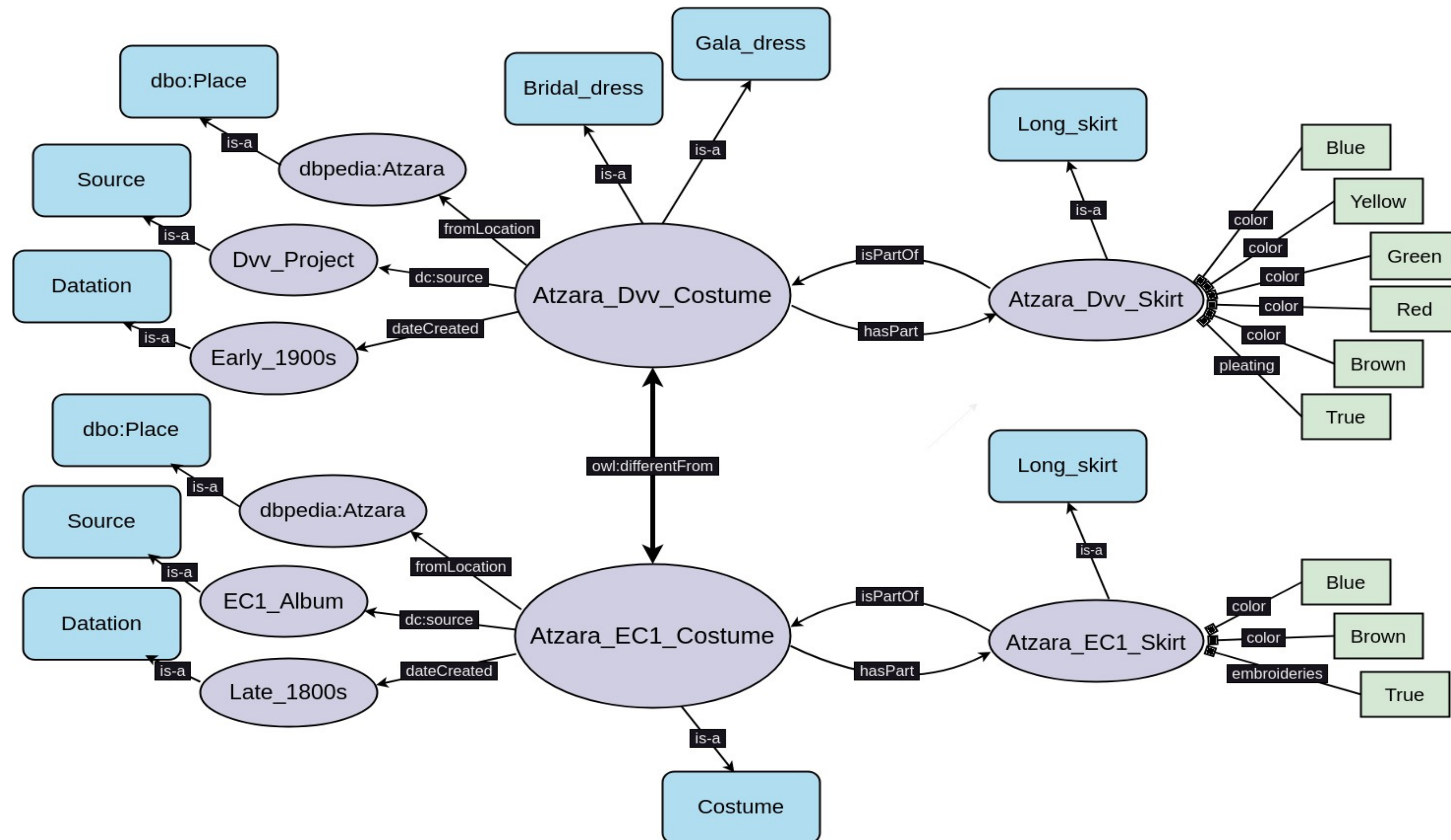
- A historical source (a **1898 illustrated book** authored by the Sardinian historian Enrico Costa)
- The online catalogue provided by **ArCo**, and the results of a project conducted by the Ethnographic Institute of Sardinia (**ISRE**). These online sources facilitated access to photographs of both costumes and individual garments.

Entities imported from other knowledge graphs are linked to corresponding individuals within Bistiris using the **owl:sameAs** property.

Entities representing different costumes from the same place of origin are related to each other through the **owl:differentFrom** property.

## Using Bistiris

Bistiris presents a promising support for the representation of traditional costumes.



- Bistiris can be a very valuable support to highlight recurrences with respect to the **colours, fashions and dressing** of the garments.
- It is worth noting that **values written in blue** are inferred by the reasoner.

Giubbetto  
covers Corset\_belt  
covers Shirt  
color Silver  
color Red  
color Black  
color Bordeaux  
floral\_embroideries true  
embroideries true

Shirt  
covered\_by Corset\_belt  
covered\_by Giubbetto  
color White

Long\_skirt  
covered\_by Panel\_apron  
covers Long\_skirt\_2  
sewn\_togheter Long\_skirt  
color White  
color Red  
color Bordeaux  
pleating true  
floral\_embroideries true  
embroideries true



Headscarf  
color Brown  
floral\_embroideries true  
embroideries true

Corset\_belt  
covered\_by Giubbetto  
sewn\_togheter Long\_skirt  
covers Shirt  
color White  
color Bronze  
color Bordeaux  
points true

Panel\_apron  
covers Long\_skirt  
covers Long\_skirt\_2  
color White  
color Bordeaux  
color Yellow  
triangle\_shaped true  
floral\_embroideries true  
apron\_panel true  
embroideries true

Long\_skirt\_2  
covered\_by Long\_skirt  
covered\_by Panel\_apron  
color Blue  
color Red  
color Bordeaux

## Conclusion & Future work

Bistiris represents an ongoing effort toward continual improvement and enhancement. As part of our current and future work, we are dedicated to **integrating the ontology with ArCo and CIDOC-CRM**, to enhance its interoperability and alignment with international standards.

Furthermore, we aim to **align our approach to date representation** within the ontology with other schemas used in the realm of Linked Data. This alignment would facilitate more robust research opportunities by leveraging temporal periods effectively.

Looking ahead, enriched by **feedback from expert users**, Bistiris will facilitate comparisons of costumes across various institutions and private collections, enabling comprehensive research and analysis.





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# Thank you for your attention!



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