 In the later stage of knowledge mapping construction, this paper uses automatic ontology construction technology to automatically build (update and iterate) ontology through data driven, and then it is modified and confirmed by combining quality evaluation method and manual audit.

**1.  What is ontology?**

In this paper, ontology refers to the formal and detailed description of concepts in a certain domain, which includes:

* Classes: describe concepts in a domain
* Describe each concept's slots attribute
* Facets: describe the limitations of attributes

An ontology and its class instance set constitute a knowledge base.In practical application, building an ontology includes:

* Define concepts in Ontology
* The concept is layered to determine the relationship between superclass and subclass
* Define the properties of the concept and the restrictions on the values of these properties
* Fill in these property values for the instance

**2.  Why build ontology?**

The main reasons for ontology construction are as follows

* Sharing a common understanding of information structure between people or software
* Realize the reuse of domain knowledge
* Make the domain hypothesis clearer
* Separating domain knowledge from operational knowledge
* Analysis domain knowledge

**3.  Three basic principles in ontology construction**

* There is no absolutely right way to model a domain.There are always feasible alternatives, and the best solution depends on the specific application scenarios and expected scalability;
* Ontology development must be an iterative process;
* The concepts in ontology should be close to the objects (physical or logical) and relationships in the corresponding domain.These are most likely to appear as nouns (objects) or verbs (Relations) in the sentences describing the domain.

**4.  In this paper, the construction process of military ontology is discussed**

**Determine the domain and scope of Ontology**: after investigating many online articles about ontology construction, especially military ontology construction, we also found some military ontology that can be used as a reference.In this paper, we mainly extend and modify the ontology based on these ontology.

图示

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**Listing important terms in Ontology:** term list is very important, we need to create up to 10W ontologies, so we must ensure the accuracy of the list.The next two steps are to develop the class hierarchy and define conceptual properties.These two steps are the most important and closely related steps in ontology design. We usually create some concepts in the hierarchy, and then describe the properties of these concepts.

Military terminology reference:https://wenku.baidu.com/view/6298be1959eef8c75ebfb304.html

https://wenku.baidu.com/view/cc4cc8a0fb0f76c66137ee06eff9aef8941e48bd.html

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图1. 军事术语

**Define the class and its hierarchy**

* There are several ways to define a class and its hierarchy
* Top down approach: define the broadest concepts in the field, then refine them
* Bottom up approach: first define the most specific concepts in the domain, and then summarize them
* Hybrid method: combine the above two methods.

This paper mainly adopts a top-down approach.The general conceptual hierarchy is shown in the figure below

图示

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**Define attributes and attribute restrictions:**

We have selected terms from the list in step 3 to build the class, and most of the remaining terms will be class properties.Generally speaking, attributes can be divided into the following categories:

* + Intrinsic attributes: such as tank length and height
  + External attributes: the name and category of the tank
  + Components: for structured objects, they can be physical or abstract components
  + Relationships: relationships with other individuals (attention and class hierarchy)

There are many restrictions on the attributes of a class, such as the type of value, the allowed value, the number of values, and so on.Here are some common facets:

Attribute value type: the type describing the value of an attribute. The common types are:

* String type
* Number type
* Boolean type
* Enumerated type
* Instance type

图示

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**Domain and scope of attributes**

According to the above class hierarchy diagram, the owl file is exported after using protege 4.30 ontology.Some of them are as follows:

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**Create examples:**

Select a class, create an instance of the class, and fill in the attribute value.