# *Extending Schema.org with GoodRelations and Productontology.org*

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# GoodRelations

http://purl.org/goodrelations/

# Who uses GoodRelations?

- Google, Yahoo, soon Bing
- BestBuy
- Overstock.com
- Tradoria
- Sears
- Volkswagen
- ...

# The Product Ontology

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GoodRelations The Web Vocabulary for E-Commerce http://purl.org/goodrelations/

## The Product Types Ontology: Class Definition for "Hammer"

This page is part of http://www.productontology.org/, a huge, precise dictionary of product types for advertising your products or services with the GoodRelations standard.

http://www.productontology.org/

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pto:Hammer (rdf:type owl:Class)

**URI** http://www.productontology.org/id/Hammer
**rdfs:subClassOf** gr:ProductOrService
**rdfs:label** Hammer (as a class of products of services)
**Translation(s):** *Hamor@ang; مطرقة@ar; Kūjātis@bat-smg; Молат@be; Чук@bg; □□□□□□□@bn; Morzhol@br; Čekić (alat)@bs; Martell (eina)@ca; Kladivo@cs; Hammer@da; Hammer@de; Σφυρί@el; Martelo@eo; Martillo@es; Vasar@et; Mailu@eu; چکش@fa; Vasara@fi; Marteau (outil)@fr; Höömerk@frr; Casúr@ga; Martelo@gl; हथौड़ा@hi; Čekić@hr; Mato@ht; Palu (alat)@id; Martelo@io; Hamar@is; Martello (tecnologia)@it; 槌@ja; Gandèn@jv; 망치@ko; Malleus (instrumentum)@la; Hummer (Handwierksgeschir)@lb; Plaktukas@lt; Āmurs@lv; Алх@mn; हातोडा@mr; Tukul@ms; Hamer (gereedschap)@nl; Hammar@nn; Hammer (redskap)@no; Martiliu@pam; Młotek@pl; چکښ@ps; Martelo@pt; Takana@qu; Ciocan@ro; Молоток@ru; Marteddu@scn; Kladivo (nástroj)@sk; Burris@so; Чекић@sr; Hammare (handverktyg)@sv; சுத்தியல்@ta; □□□□□□@te; ค้อน@th; Binalalak@tl; Çekiç@tr; Молоток@uk; Búa@vi; Martilyo@war; האמער@yi; 槌@zh;*

**rdfs:comment**

A hammer is a tool meant to [illegible] breaking up objects. Hammers are often designed for a specific purp[illegible]e weight in the head. The basic design is hand-operated, but there [illegible]ay be the oldest tool for which definite evidence exists. Stone ham[illegible]alogy, the name hammer has also been used for devices that are designed to deliver blows, e.g. in the caplock mechanism of firearms. (Source: Wikipedia, the free encyclopedia, see http://en.wikipedia.org/wiki/Hammer)

*Note: The extraction of the abstract from the Wikipedia page may sometimes yield imperfect results. We are improving the algorithm regularly.*

http://www.productontology.org

der Bundeswehr Universität München

# Productontology.org adds the specificity of products and services to the schema.org environment

## Plus: Translations in up to 100 languages

# Fire Extinguisher

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pto:Fire_extinguisher (rdf:type owl:Class)

**URI** http://www.productontology.org/id/Fire_extinguisher
**rdfs:subClassOf** gr:ProductOrService
**rdfs:label** Fire extinguisher (as a class of products of services)
**Translation(s):** *مطفأة حريق@ar; □□□□□□□□□□□□□ □□□□□□@bn; Extintor@ca; Hasicí přístroj@cs; Ildslukker@da; Feuerlöscher@de; Fajroestingilo@eo; Extintor@es; Palosammutin@fi; Extincteur@fr; כיבוי@he; अग्निशमन यंत्र@hi; Tűzoltóberendezés@hu; Pemadam api@id; Estintore@it; 消火器@ja; 소화기@ko; Feierläscher@lb; Gesintuvas@lt; Brandblusser@nl; Brannslokningsapparat@no; Gaśnica@pl; Extintor@pt; Thasnuna@qu; Огнетушитель@ru; Hasiaci prístroj@sk; Brandsläckare@sv; Kizima moto@sw; தீயணைப்பான்@ta; Вогнегасник@uk; 滅火器@zh; 滅火筒@zh-yue;*

**rdfs:comment**

A fire extinguisher is an active fire protection device used to extinguish or control small fires, often in emergency situations. It is not intended for use on an out-of-control fire, such as one which has reached the ceiling, endangers the user (i.e. no escape route, smoke, explosion hazard, etc.), or otherwise requires the expertise of a fire department. Typically, a fire extinguisher consists of a hand-held cylindrical pressure vessel containing an agent which can be discharged to extinguish a fire. In the United States, fire extinguishers, in all buildings other than houses, are generally required to be serviced and inspected by a Fire Protection service company at least

Photo by Dante Alighieri. Licensed under CC BY-NC-SA 2.0.

# Bollard

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## The Product Types Ontology: Class Definition for "Bollard"

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pto:Bollard

**URI** http://www.productontology.org/id/Bollard
**rdfs:subClassOf** gr:ProductOrService
**rdfs:label** Bollard (as a class of products of services)
**Translation(s):** *Poller@de; Bolardo@eo; Bolardo@es; Bollard@fr; Bitva@hr; Bitta@it; ボラード@ja; 볼라드@ko; Bolder@nl; Puller@no; Poler@pl;*

**rdfs:comment**

A bollard is a short vertical post. Originally it only meant a post used on a quay for mooring. The word now also describes a variety of structures to contr traffic, such as posts arranged in a line to obstruct the passage of motor vehicles. In addition, bollards are used in the lighting industry to describe shor fixtures. The term may be related to bole, meaning a tree trunk. (Source: Wikipedia, the free encyclopedia, see http://en.wikipedia.org/wiki/Bollard)

*Note: The extraction of the abstract from the Wikipedia page may sometimes yield imperfect results. We are improving the algorithm regularly.*

Photo by http://en.wikipedia.org/wiki/User:KVDP. Licensed to the Public Domain.

# Potato Pancake

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## The Product Types Ontology: Class Definition for "Potato pancake"

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pto:Potato_pancake (rdf:type owl:Class)

**URI** http://www.productontology.org/id/Potato_pancake
**rdfs:subClassOf** gr:ProductOrService
**rdfs:label** Potato pancake (as a class of products of services)
**Translation(s):** *Raiwadadschi@bar; Дранікі@be; Bramborák@cs; Kartoffelpuffer@de; Kartoffelpuffer@es; Galette de pommes de terre@fr; לביבה@he; Tortel di patate@it; ポテトパンケーキ@ja; Rievkoche@ksh; Gromperekichelchen@lb; Aardappelpannenkoekje@nl; Røstipotet@no; Placki ziemniaczane@pl; Reibekuchen@pt; Драники@ru; Raggmunk@sv; Деруни@uk;*

**rdfs:comment**

Potato pancakes are shallow-fried pancakes of grated potato, flour and egg, often flavored with grated onion or garlic and seasoning. Potato pancakes may be topped with a variety of condiments, ranging from the savory (such as sour cream) to the sweet (such as apple sauce or sugar), or they may be served ungarnished. Potato pancakes are sometimes made from mashed potatoes to produce pancake-shaped croquettes. (Source: Wikipedia, the free encyclopedia, see http://en.wikipedia.org/wiki/Potato_pancake)

Photo by Oleh Petriv. Licensed under CC BY 2.5.

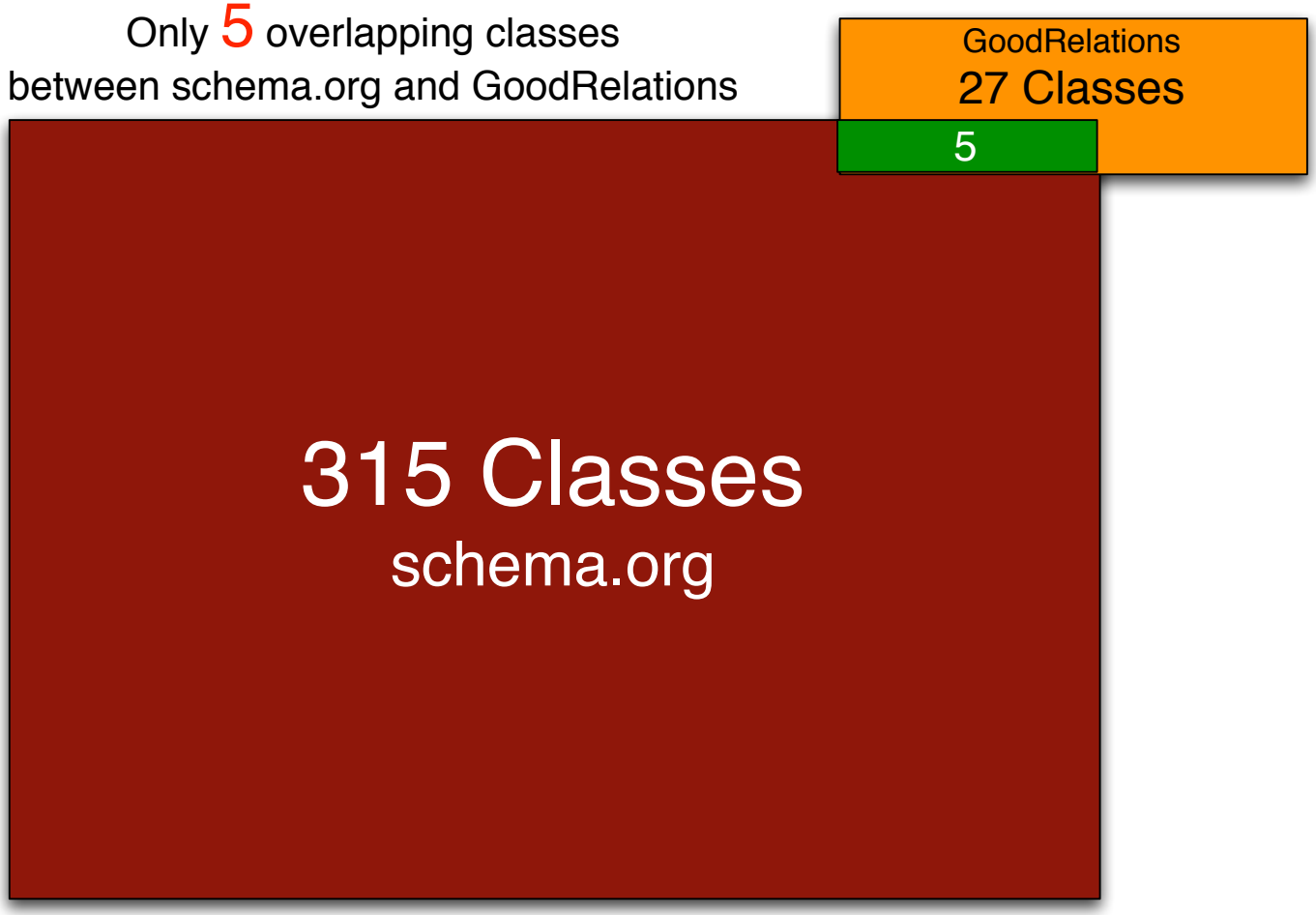
# Focus

**schema.org:** Broad, entry-level schema for the basics of many domains

**GoodRelations:** Powerful E-Commerce Schema and Extension

# Small Overlap

Only 5 overlapping classes
between schema.org and GoodRelations



# Extending Schema.org with GoodRelations

## Scenario 1: Using GoodRelations in Microdata syntax [edit]

You can use GoodRelations directly in Microdata syntax:

```
<div itemscope itemtype="http://purl.org/goodrelations/v1#Offering" itemid="#offer">
  <div itemprop="name">Hepp Personal SCSI Controller Card</div>
  <div itemprop="description">The Hepp Personal SCSI is a 16-bit
add-on card that allows attaching up to seven SCSI devices to your computer.</div>
  <link itemprop="hasBusinessFunction"  href="http://purl.org/goodrelations/v1#Sell" />
  <div itemscope itemprop="hasPriceSpecification"
         itemtype="http://purl.org/goodrelations/v1#UnitPriceSpecification">Price:
    <meta itemprop="hasCurrency" content="USD">$
    <span itemprop="hasCurrencyValue">99.99</span>
    <time itemprop="validThrough" datetime="2012-11-30T23:59:59Z"></time>
  </div>
  Condition: <div itemprop="condition">used</div>
  EAN/UPC: <span itemprop="hasEAN_UCC-13">1234567890123</span>
  MPN: <span itemprop="hasMPN">PSCSI</span>
  Article No. <span itemprop="hasStockKeepingUnit">123-456</span>
  Availability: <span itemscope itemprop="hasInventoryLevel"
       itemtype="http://purl.org/goodrelations/v1#QuantitativeValue">
    <meta property="hasMinValue" content="1">In-stock
  </span>
</div>
```

## Scenario 2: Using GoodRelations properties to extend schema.org types [edit]

You can use GoodRelations elements to extend schema.org types by details that are not covered by schema.org, e.g. shipping charges or eligible countries:

```
<div itemscope itemtype="http://schema.org/Offer" itemid="#offer">
  <div itemprop="name">Hepp Personal SCSI Controller Card</div>
  <div itemprop="description">The Hepp Personal SCSI is a 16-bit add-on card that allows
attaching up to seven SCSI devices to your computer.</div>
  <link itemprop="http://purl.org/goodrelations/v1#hasBusinessFunction"
        href="http://purl.org/goodrelations/v1#Sell" />
<!-- Shipment fees -->
  Delivery costs to
  <div itemscope itemprop="http://purl.org/goodrelations/v1#hasPriceSpecification"
       itemtype="http://purl.org/goodrelations/v1#DeliveryChargeSpecification">
    <meta itemprop="eligibleRegions" content="DE">Germany:
    <meta itemprop="hasCurrency" content="EUR">Euro:
    <span itemprop="hasCurrencyValue">10.00</span>
    <link itemprop="appliesToDeliveryMethod"
          href="http://purl.org/goodrelations/v1#UPS" />(via UPS)
  </div>
<!-- other offer properties follow here -->
...
</div>
```

## Scenario 3: Using schema.org properties to extend GoodRelations types [edit]

You can used schema.org properties and types in combination with GoodRelations types. This is in particular recommended for attaching images, addresses, and geo-location information information, because such will then all come from a single complementing vocabulary instead of from various Web vocabularies (vCard, geo, WGS84, FOAF, ...).

```
<div itemscope itemtype="http://purl.org/goodrelations/v1#BusinessEntity">
  <span itemprop="legalName">ACME Bagel Bakery Ltd.</span>
Contact Details:
  <div itemscope itemprop="http://schema.org/address"
         itemtype="http://schema.org/PostalAddress">
    Main address:
      <span itemprop="streetAddress">Bagel Street 1234</span>
      <span itemprop="postalCode">12345</span>
      <span itemprop="addressLocality">Munich, Germany</span>
  </div>
<!-- The following properties use full URIs because they are attached
     to a **GoodRelations type** but come from schema.org -->
    Tel: <span itemprop="http://schema.org/telephone">+49-89-12345678-0</span>,
    Fax: <span itemprop="http://schema.org/faxNumber">+49-89-12345678-99</span>,
    E-mail: <span itemprop="http://schema.org/email">contact@example.org</span>
    <link itemprop="http://schema.org/url" href="http://www.acme-bagels.com/" />
</div>
```

# Schema.org with productontology.org

```
1  <div itemscope itemtype="http://schema.org/Product">
2      <link itemprop="http://www.w3.org/1999/02/22-rdf-syntax-ns#type"
3            href="http://www.productontology.org/id/Fire_extinguisher" />
4      <!-- other schema.org properties go in here -->
5  </div>
```

# What we need from schema.org?

- Tolerate secondary type property
  - rdf:type
  - **secondaryType** for http://schema.org/Thing
- Tolerate **full URIs** for external properties
- In particular in validation tools
- 1-page statement on Webmaster blog
- Microdata support for GoodRelations

# Outlook

- Full integration?
  - No fragmentation
  - No significant renaming
  - Attribution?
- Integrating GoodRelations modules
  - Tickets
    - http://purl.org/tio/ns
  - Vehicles
    - http://purl.org/vso/ns

# Additional Resources

- http://wiki.goodrelations-vocabulary.org/Microdata
- http://wiki.goodrelations-vocabulary.org/GoodRelations_and_schema.org
- http://wiki.goodrelations-vocabulary.org/GoodRelations_for_Semantic_SEO
- http://www.productontology.org
- http://purl.org/tio/ns (Tickets extension)
- http://purl.org/vso/ns (Extension for cars, boats, bikes – rental and sales)

# Thank you!

## Prof. Dr. Martin Hepp

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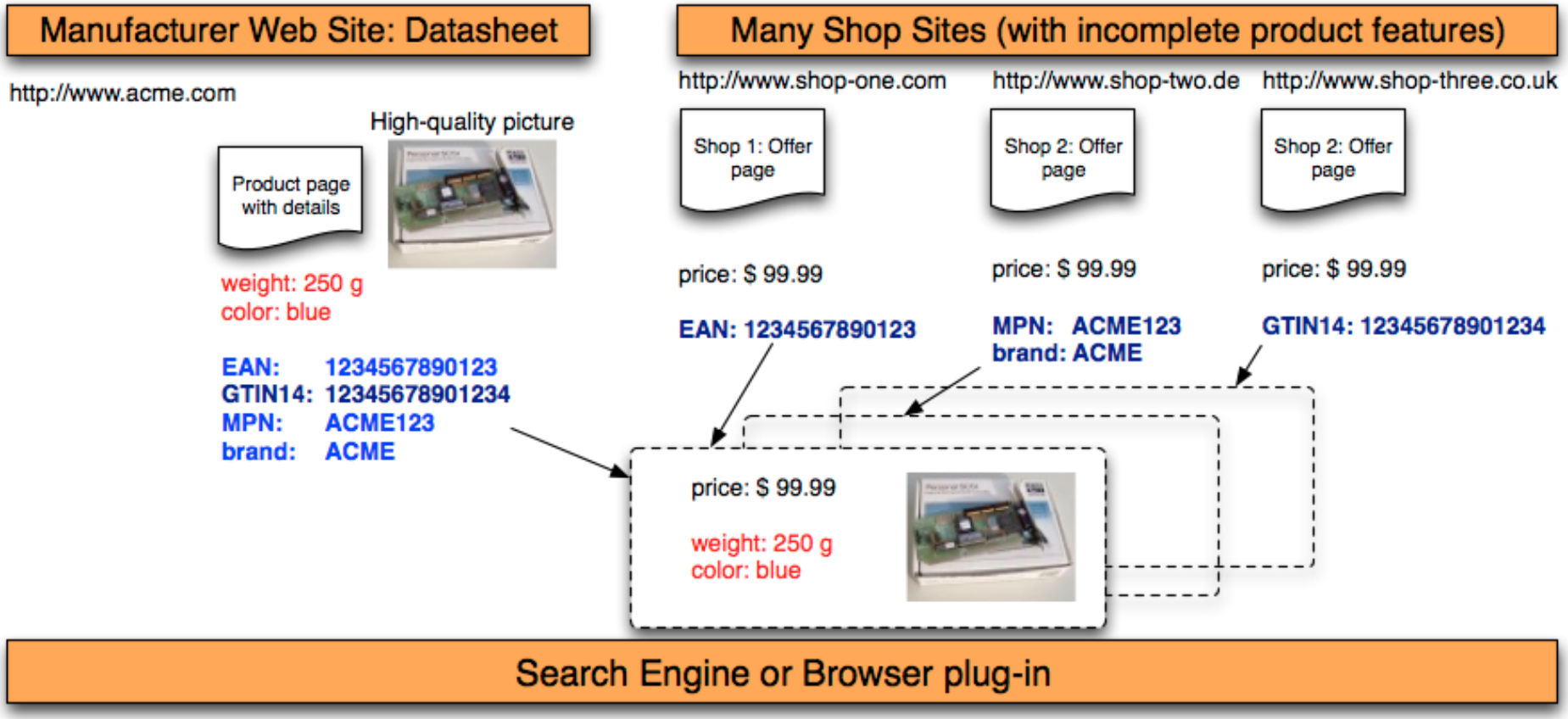
# Bonus track

# Power Use-Case: Datasheets



# Example: Offer

## Thing > Intangible > Offer

An offer to sell an item—for example, an offer to sell a product, the DVD of a movie, or tickets to an event.

| Property | Expected Type | Description |
|---|---|---|
| **Properties from Thing** | | |
| description | Text | A short description of the item. |
| image | URL | URL of an image of the item. |
| name | Text | The name of the item. |
| url | URL | URL of the item. |
| **Properties from Offer** | | |
| aggregateRating | AggregateRating | The overall rating, based on a collection of reviews or ratings, of the item. |
| availability | ItemAvailability | The availability of this item—for example In stock, Out of stock, Pre-order, etc. |
| itemCondition | OfferItemCondition | The condition of the item for sale—for example New, Refurbished, Used, etc. |
| itemOffered | Product | The item being sold. |
| price | Number or Text | The offer price of the product. |
| priceCurrency | Text | The currency (in 3-letter ISO 4217 format) of the offer price. |
| priceValidUntil | Date | The date after which the price is no longer available. |
| reviews | Review | Review of the item. |
| seller | Organization | The seller of the product. |

**More specific types**

- AggregateOffer

# Example: GoodRelations Offer

**gr:Offering** (rdf:type owl:Class)

? Ask a question related to this element

**URI** http://purl.org/goodrelations/v1#Offering
**rdfs:label** Offering

**rdfs:comment**

An offering represents the public, not necessarily binding, not necessarily exclusive, announcement by a gr:BusinessEntity to provide (or seek) a certain gr:BusinessFunction for a certain gr:ProductOrService to a specified target audience. An offering is specified by the type of product or service or bundle it refers to, what business function is being offered (sales, rental, ...), and a set of commercial properties. It can either refer to
(1) a clearly specified instance (gr:Individual),
(2) to a set of anonymous instances of a given type (gr:SomeItems),
(3) a product model specification (gr:ProductOrServiceModel),
see also section 3.3.3 of the GoodRelations Technical Report). An offering may be constrained in terms of the eligible type of business partner, countries, quantities, and other commercial properties. The definition of the commercial properties, the type of product offered, and the business function are explained in other parts of this ontology in more detail.

Example: Peter Miller offers to repair TV sets made by Siemens, Volkswagen Innsbruck sells a particular instance of a Volkswagen Golf at $10,000.

**is rdfs:domain of** gr:acceptedPaymentMethods gr:addOn gr:advanceBookingRequirement gr:availabilityEnds gr:availabilityStarts gr:availableAtOrFrom gr:availableDeliveryMethods gr:category gr:condition gr:deliveryLeadTime gr:eligibleCustomerTypes gr:eligibleDuration gr:eligibleRegions gr:eligibleTransactionVolume gr:hasBusinessFunction gr:hasEAN_UCC-13 gr:hasEligibleQuantity gr:hasGTIN-14 gr:hasGTIN-8 gr:hasInventoryLevel gr:hasMPN gr:hasPriceSpecification gr:hasStockKeepingUnit gr:hasWarrantyPromise gr:includes gr:includesObject gr:serialNumber gr:validFrom gr:validThrough
**is rdfs:range of** gr:addOn gr:offers gr:seeks

**Discussions and Links**

Click here for additional resources