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# GTM Level 1 Proposal

July 2, 2007



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- **This is a first GTM level 1 proposal**
  - intended as a strawman to kick-start discussion
  - will be properly formalized once feedback indicates that the basic form of the proposal is accepted by the committee
- **Feedback wanted!**
  - is this headed in the right direction?
  - what is good?
  - what is bad?
  - what is missing?
  - what is too much?
  - what is not clear?
  - ...



## Mapping to TMCL

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- **GTM level 1 will have a defined mapping to TMCL**
  - this mapping is not fully defined in this proposal yet
- **Note: TMCL schemas are expressed as topic maps**

# Topic types

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foo:person

- **Topic types are always boxes**
- **A QName (or id) giving the subject (or item) identifier must be present**
- **Prefixes are declared with floating text in CTM syntax**

%prefix foo <http://psi.example.org/>

# Properties

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foo:person	
tm:name	1..1
foo:given-name	1..1
foo:family-name	1..1
foo:email : string	1..1
foo:biography : uri	0..*
@ oasis:language	

- **A division for names may or may not be present**
- **A division for occurrences may or may not be present**
  - must always be the second division
  - first can be empty
- **Cardinality is omissible**
- **Datatypes are omissible**
- **@ oasis:language means foo:biography can be scoped with topics of this type**

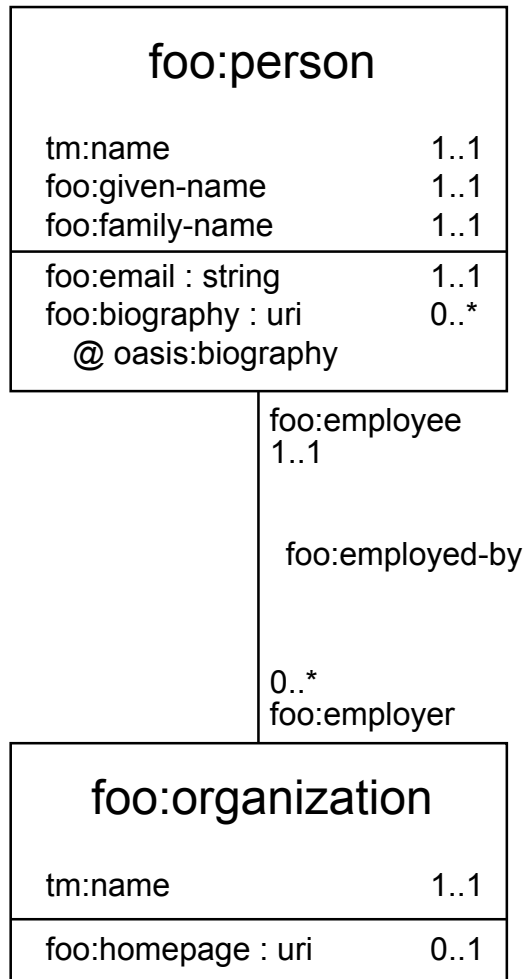
# Abstract topic types

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<i>foo:person</i>	
tm:name	1..1
foo:given-name	1..1
foo:family-name	1..1
foo:email : string	1..1
foo:biography : uri	0..*
@ oasis:biography	

- **As in UML**
  - write the topic type identifier in italics

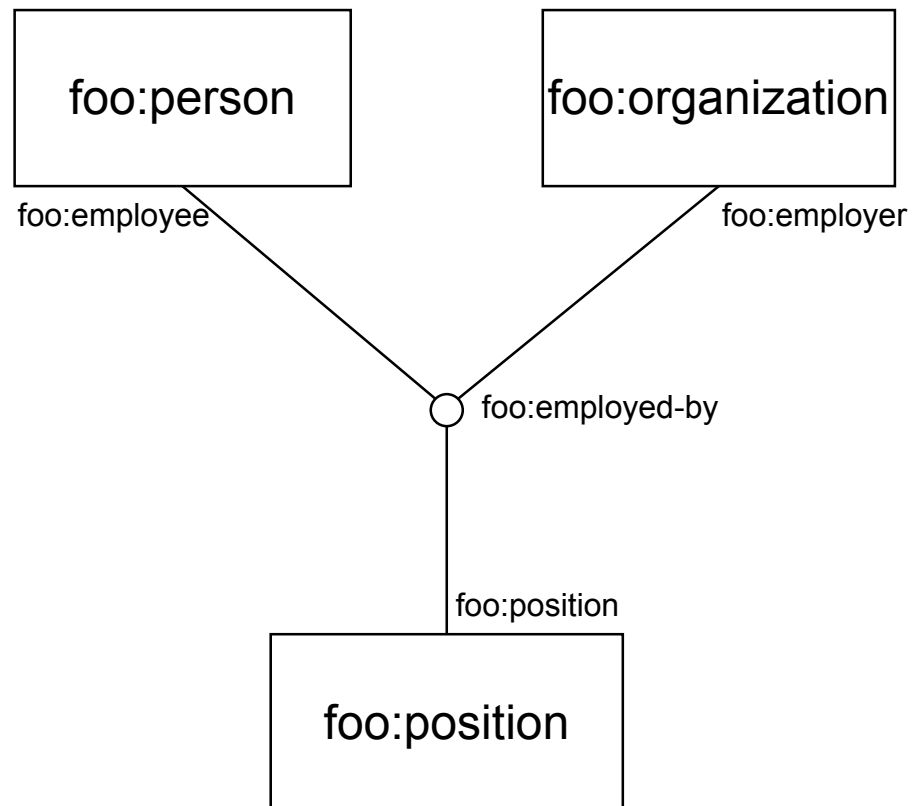
# Binary associations



- **Binary associations are lines**
  - association type given in middle
  - role types given near player
  - cardinality from player side given near player

# N-ary associations

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- **N-ary associations use a circle to represent the association type**
  - behaviour is otherwise as for binaries



# Unary associations

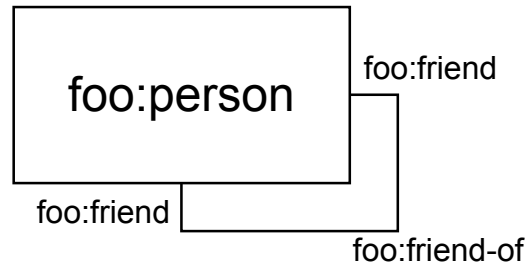
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- **Unary associations follow the same pattern**
- **There must be restrictions on the possible cardinalities here**

# Symmetric associations

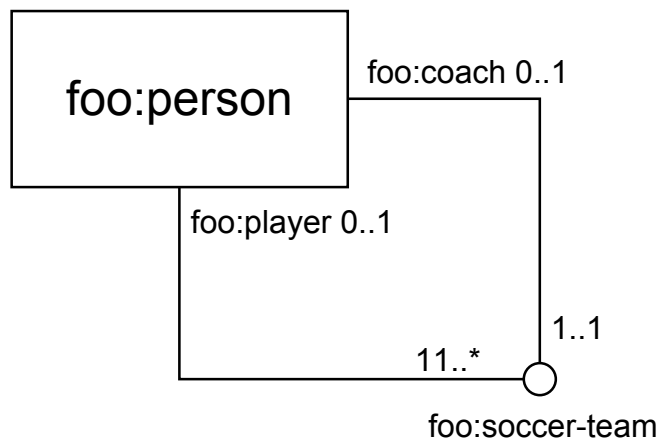
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- **Binary associations where the same role type appears on both sides**
- **Issue: cardinality on both sides must be consistent**

# Repeatable roles

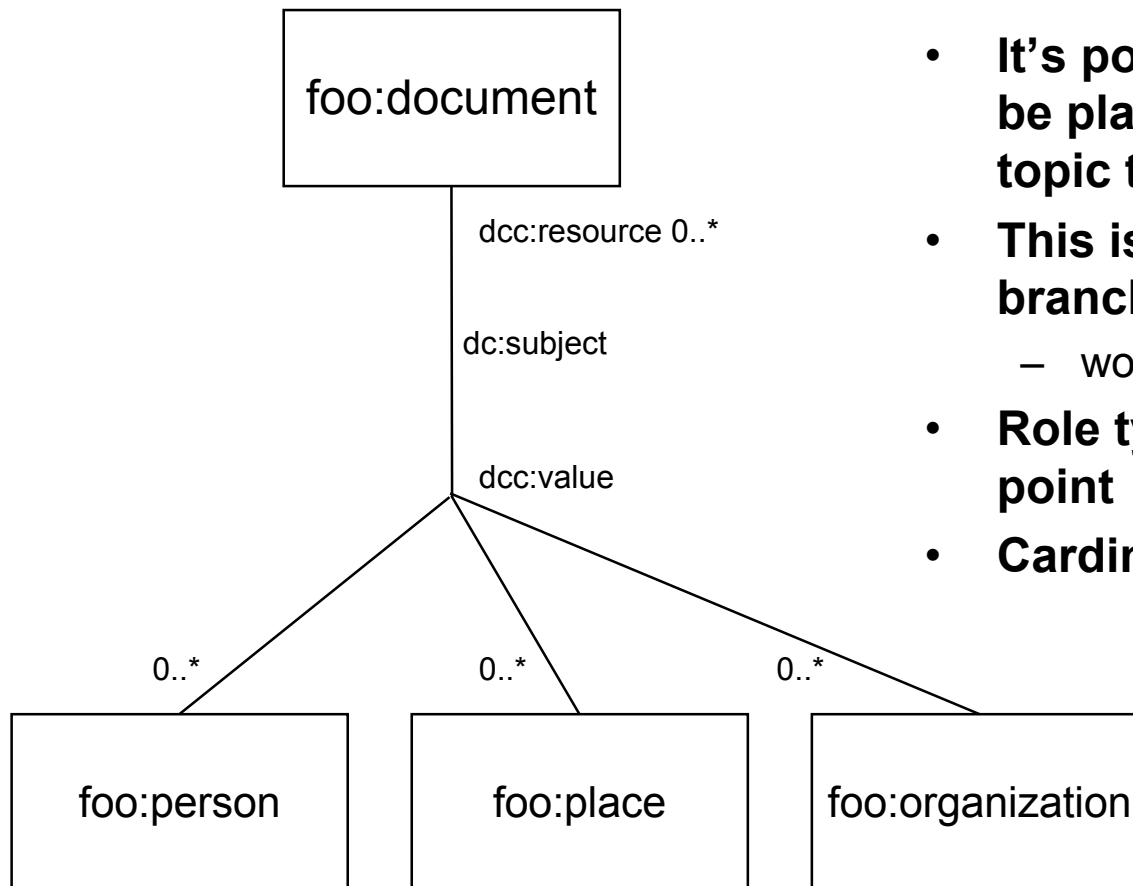
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- For n-ary associations the cardinalities of roles in instance associations can be given
- For binary associations they are fixed at 1..1 (except if repeated, as in symmetric)
- Disclaimer: this is *not* an example of good modelling

# Roles with many player types

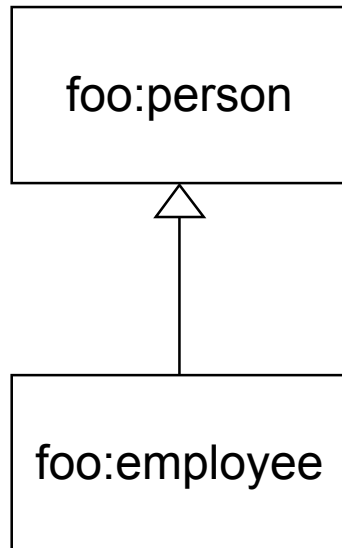
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- It's possible for a role type to be played by more than one topic type
- This is represented by branching the line
  - works for both n-ary and binary
- Role type given at branching point
- Cardinalities given at player

# Subclassing

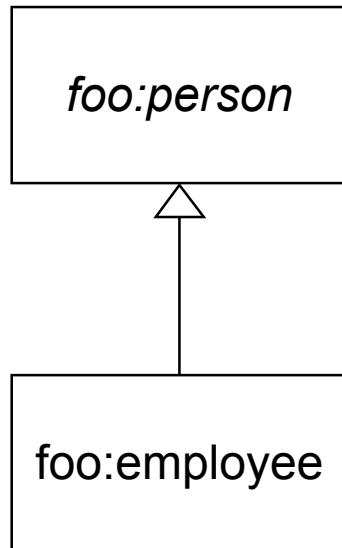
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- Effectively UML notation

# Text notes

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- Text notes documenting the diagrams are allowed
- They are given as simple rectangles containing the text note

We realize that employee is strictly speaking a role type, but...

# Identity constraints

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foo:organization	
tm:name	1..1
foo:homepage : uri	0..1
identifier	1..*

- **A separate division for these**
  - divisions have a fixed order
  - names, occurrences, identities
- **Predefined names**
  - locator (subject locator)
  - identifier (subject identifier)
  - itemid (item identifier)
- **Datatypes fixed to “uri”**



## Issue: What about names?

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- **This proposal does not put names for typing topics in the diagram**
  - the rationale is that space savings are crucial for readability in large diagrams
- **So where are the names specified?**
- **In this proposal that is considered out of scope**
  - editing tools can allow the names to be edited manually
  - and/or they can generate default names from the PSIs
  - or they can ignore them entirely





## **Issue: scope support**

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- **The support for scope needs more work**
- **Open questions:**
  - interaction of cardinality with scope
  - multiple types of scoping topics
  - ...



## **Issue: reification support**

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- **Should there be any?**
- **What should it look like?**



## **Issue: assertion constraints**

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- **Should query constraints be supported?**
- **Should regular expression constraints be supported?**



## Issue: omitted information

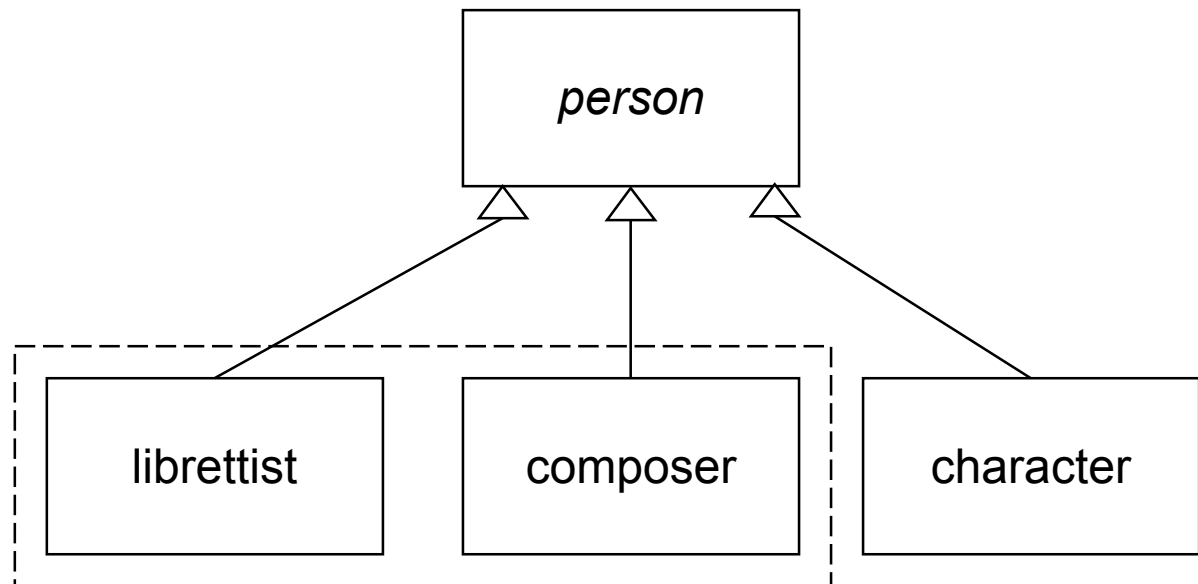
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- **GTM must indicate which information can be omitted**
- **How should omitted information be interpreted?**
  - should there be default cardinalities, for example?
  - is it possible to generate TMCL without specifying these?
  - is it better to just leave the issue of defaults to tools?
- **What about visual shorthands for omitted information?**
  - these would serve as indicators that something is present but not shown
  - is that useful? is it clutter? is it too much complexity?

## Issue: overlapping types

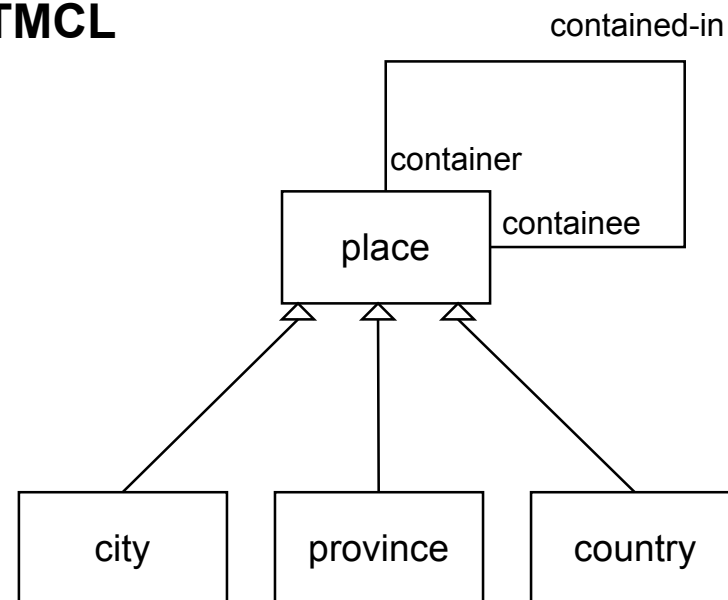
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- **It is possible for topic types to overlap**
  - for example: in the Italian Opera topic map the librettist and composer types overlap, in the sense that topics can be instances of both
- **In TMCL overlap must be explicitly stated to be allowed**
- **Should GTM support this?**
  - if so, how?



## Issue: codependent role player types

- **Given an association type contained-in that joins**
  - cities, provinces, and countries, where
  - cities must be in a province, and provinces must be in a country
  - it's not allowed to connect cities directly with countries
- **This constraint is expressible in TMCL**
- **Should it be expressible in GTM?**
- **If so, how?**





## **Issue: support for multiple schemas?**

- **TMCL allows multiple schemas to be mixed in a single topic map**
- **Should GTM allow diagrams to indicate which schema they “belong to”?**
- **The current proposal stays well clear of this**



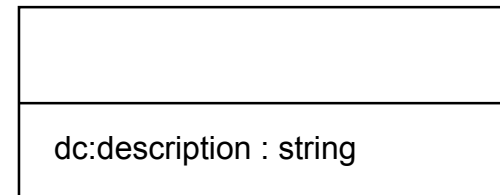
## **Issue: interchange format for graphical info**

- **We propose that we not support this**



## **Issue: documentation of non-topic types**

- **Should it be possible to make a GTM diagram that says**
  - dc:description is an occurrence type with datatype string?
- **That is, without assigning the occurrence type to any topic type...**
- **This would make it possible to create diagrams for ontology fragments**
  - on the other hand: is that useful?
- **Is the thing on the right the solution?**





## **Issue: navigable roles**

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- **UML allows navigable roles to be specified**
  - that is, to say that an association is only traversable in one direction
- **Should GTM and TMCL support this?**
  - it would not be a hard constraint, but more in the nature of a semantic hint