GTM Level 1 Proposal

July 2, 2007

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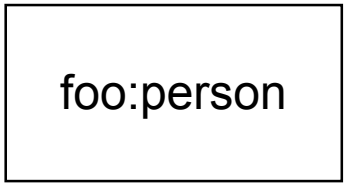
- **This is a first GTM level 1 proposal**
  - intended as a strawman to kick-start discussion
  - will be properly formalized once feedback indicates that the basic form of the proposal is accepted by the committee
- **Feedback wanted!**
  - is this headed in the right direction?
  - what is good?
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

Mapping to TMCL

- **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**

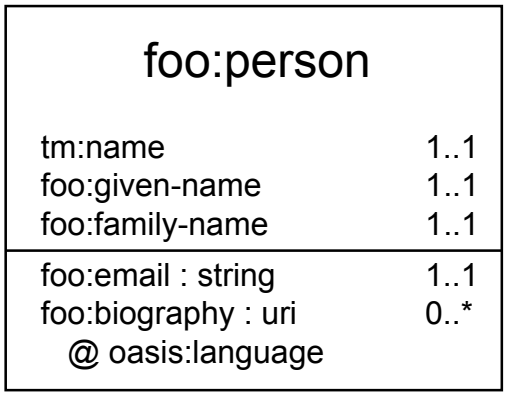
Topic types



- **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**

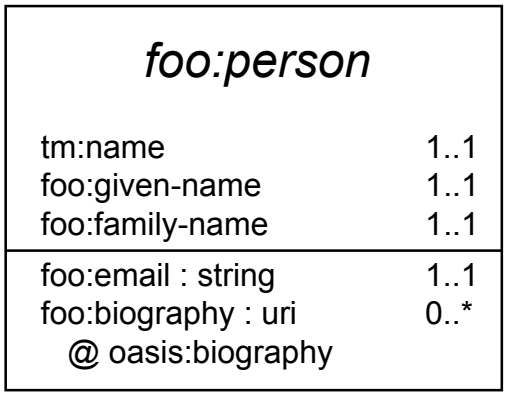
```
%prefix foo http://psi.example.org/
```

Properties



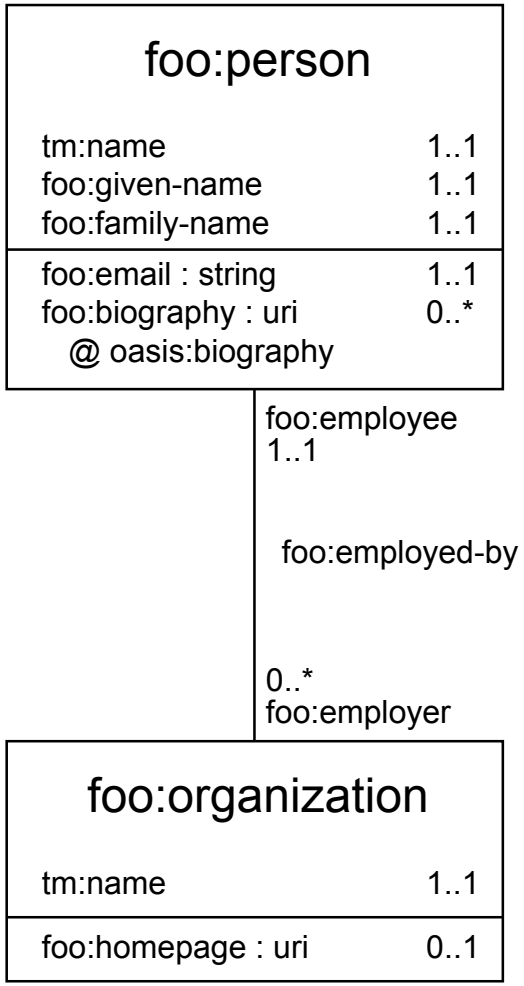
- **A division for names may or may not be present**
- **A division for occurrences may or may not be present**
  - must always be the second division
  - first can be empty
- **Cardinality is omissible**
- **Datatypes are omissible**
- **@ oasis:language means foo:biography can be scoped with topics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

Abstract topic types



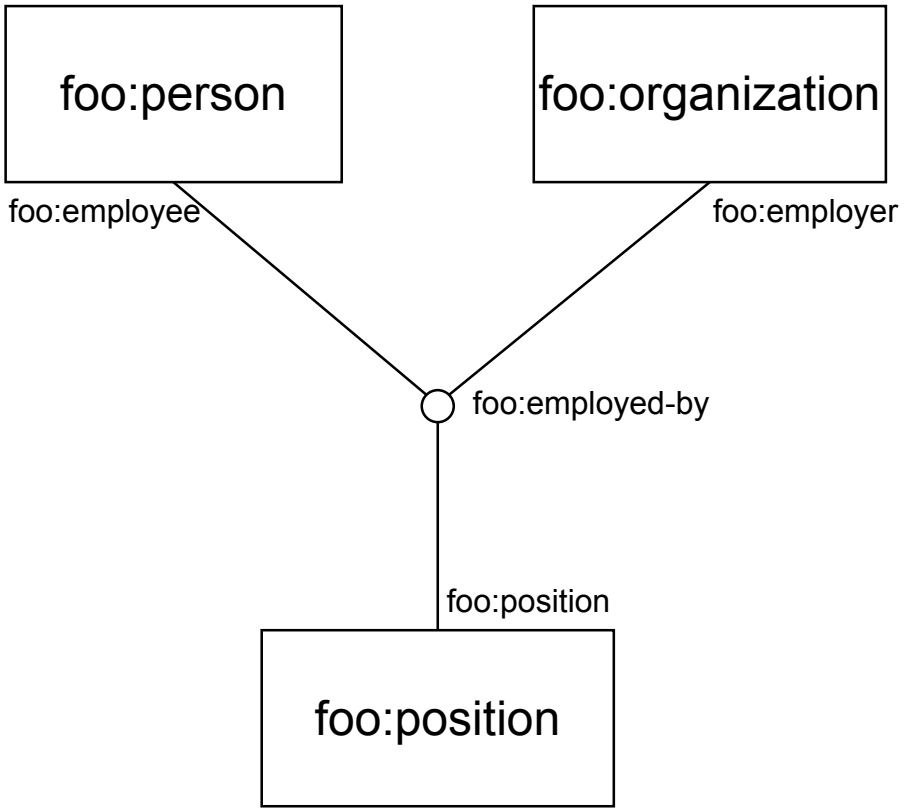
- **As in UML**
  - write the topic type identifier in italics

Binary associations



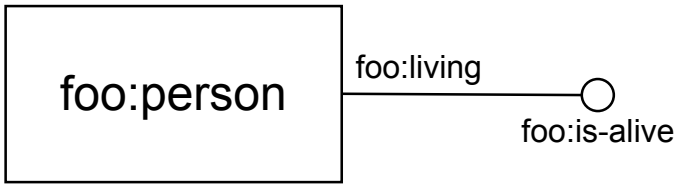
- **Binary associations are lines**
  - association type given in middle
  - role types given near player
  - cardinality from player side given near player

N-ary associations



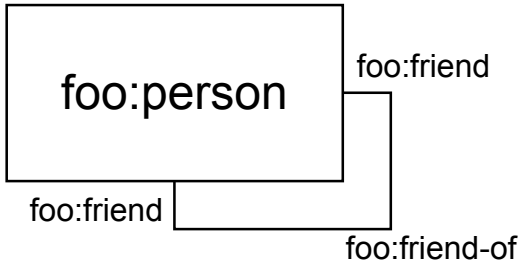
- **N-ary associations use a circle to represent the association type**
  - behaviour is otherwise as for binaries

Unary associations



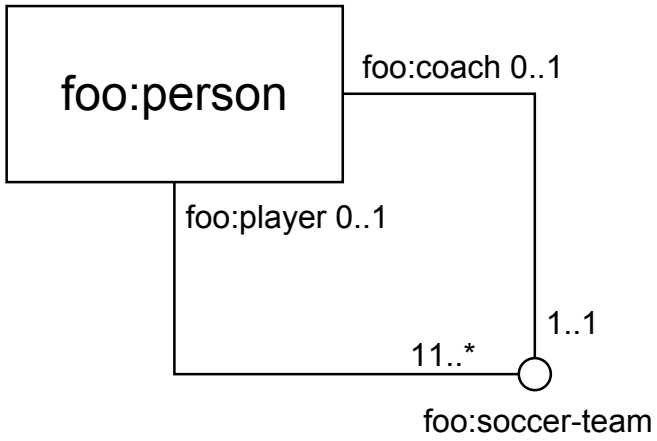
- **Unary associations follow the same pattern**
- **There must be restrictions on the possible cardinalities here**

Symmetric associations



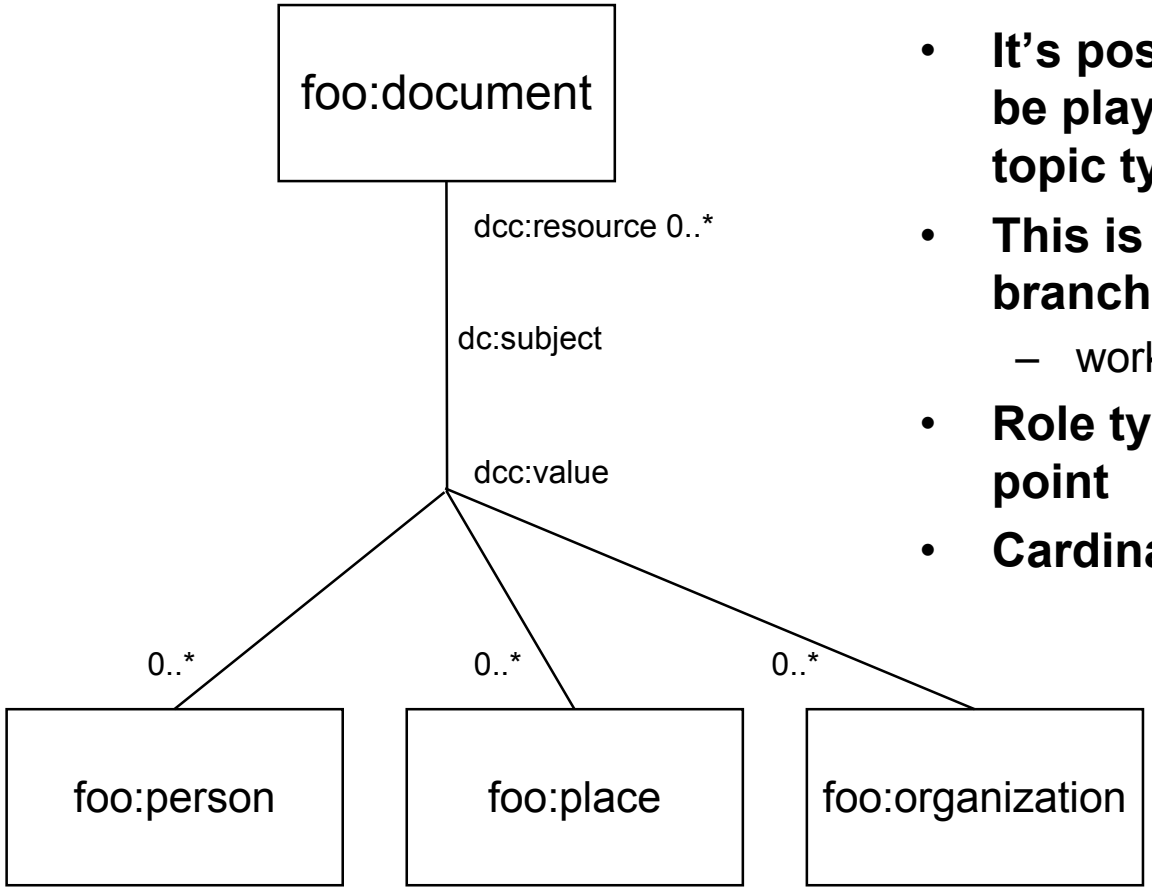
- **Binary associations where the same role type appears on both sides**
- **Issue: cardinality on both sides must be consistent**

Repeatable roles



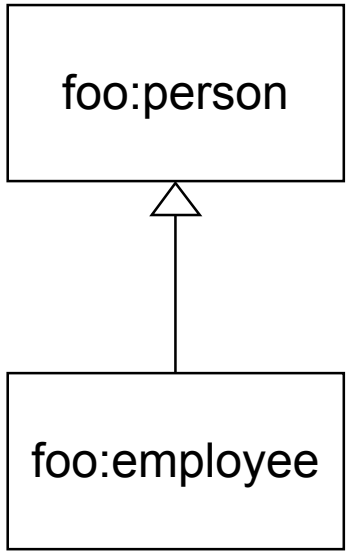
- **For n-ary associations the cardinalities of roles in instance associations can be given**
- **For binary associations they are fixed at 1..1 (except if repeated, as in symmetrics)**
- **Disclaimer: this is *not* an example of good modelling**

Roles with many player types



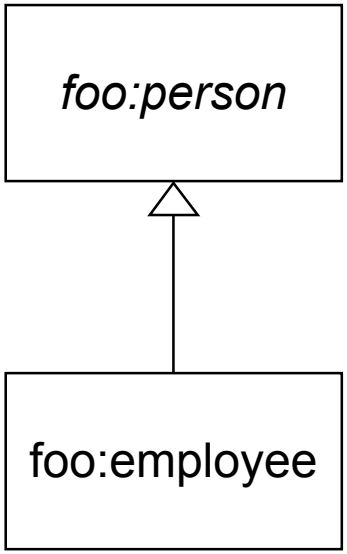
- **It's possible for a role type to be played by more than one topic type**
- **This is represented by branching the line**
  - works for both n-ary and binary
- **Role type given at branching point**
- **Cardinalities given at player**

Subclassing



- **Effectively UML notation**

Text notes



- **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

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?

- **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

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

Issue: reification support

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

Issue: assertion constraints

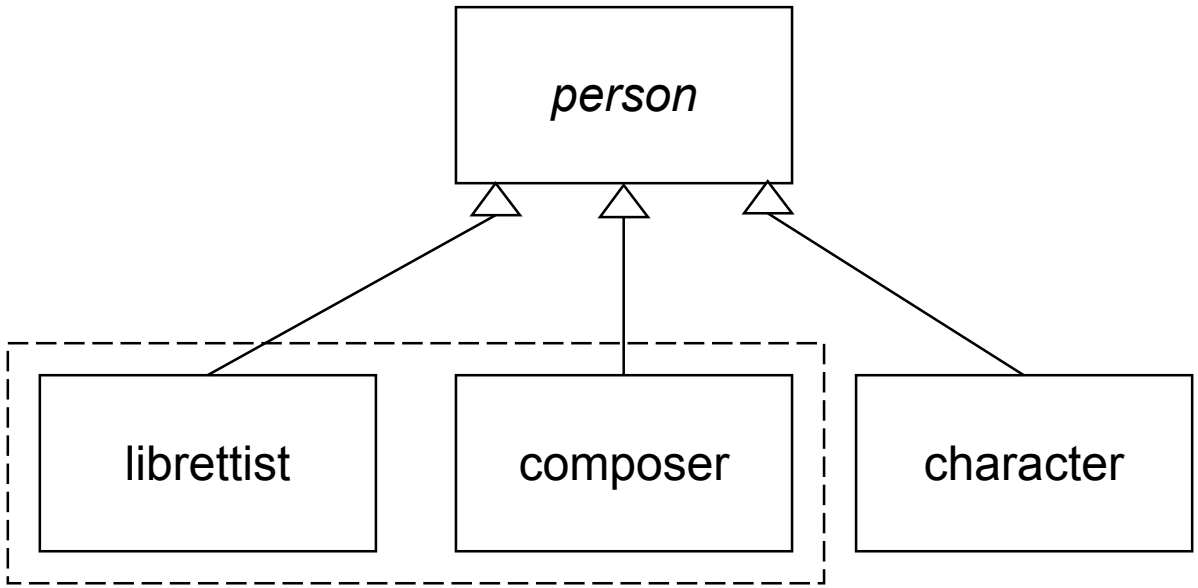
- **Should query constraints be supported?**
- **Should regular expression constraints be supported?**

Issue: omitted information

- **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?

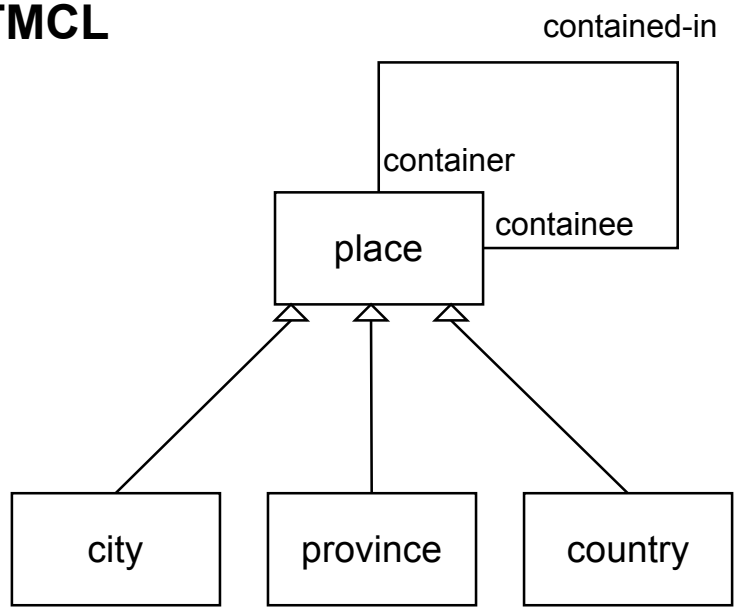
Issue: overlapping types

- **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?

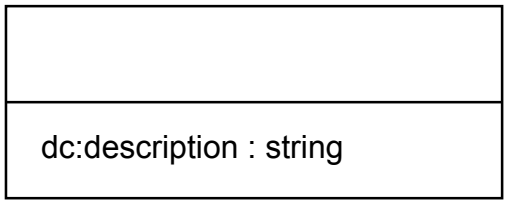
- TMCL allows multiple schemas to be mixed in a single topic map
- Should GTM allow diagrams to indicate which schema they “belong to”?
- The current proposal stays well clear of this

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

- **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