



TMQL 0.1 – Design Notes

**Notes from WG3 meeting Amsterdam, April 14-15 2004
regarding ISO 18048: Topic Maps Query Language**

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How these slides were prepared

1. Four languages for querying topic maps were presented:
 1. AsTMa?
 2. Tmpath
 3. tolog
 4. Toma
2. The strengths and weaknesses of each were discussed and noted, and consensus reached on general issues of style and structure for TMQL.
3. A draft synthesis was prepared by the group, by taking one of the candidates that was already quite close to this style (tolog) and noting the (non-trivial) changes required. These are described in the slides that follow.
4. Finally, outstanding issues were noted & a plan of work outlined - see end of slides.

Change FROM to WHERE

```
SELECT $opera
```

```
WHERE
```

```
  composed-by( $opera : opera, puccini : composer )
```

```
?
```

Allow role types to be (sometimes?) omitted

```
SELECT $opera WHERE  
WHERE  
    composed-by( $opera, puccini )  
?
```

```
SELECT $opera WHERE  
WHERE  
    composed-by( $opera, $composer )  
?
```

Add variables for associations

```
SELECT $puccini-operas
WHERE
    composed-by( $opera : opera, puccini : composer )
    AS $puccini-operas
?
```

Add path-based capabilities

```
SELECT $opera/@bn/english
WHERE
  composed-by( $opera : opera, puccini : composer )
ORDER BY $opera/premiere-date
?
```

```
SELECT $opera/@bn/english
WHERE
  composed-by( $opera, puccini ),
  $opera/premiere-date < "1900-01-01"
?
```

Add functions

Both built-in...

```
SELECT upper( $opera/@bn/english )
WHERE
  composed-by( $opera : opera, puccini : composer)
ORDER BY $opera/premiere-date
?
```

Add functions

...and user-defined

```
IMPORT "http://.../.../" AS foo
sounds-like( $N, $M) :-
    foo:soundex($N) == foo:soundex($M) .
```

```
SELECT $opera/@bn/english
WHERE
    composed-by( $opera : opera, $composer : composer),
    sounds-like( $opera/@bn/english, "toska" )
ORDER BY $opera/premiere-date
?
```


Simplify instance-of()

```
SELECT $city, COUNT($opera)
WHERE
  $city : city,
  { premiere($opera, $city) |
    premiere($opera, $theatre),
    located-in($theatre, $city) }
ORDER BY $opera DESC?
```

Add FLOWR constructors

FOR \$city

WHERE

```
$city : city,  
{ premiere($opera, $city) |  
  premiere($opera, $theatre),  
  located-in($theatre, $city) }  
ORDER BY $opera DESC?
```

RETURN

```
<city no="COUNT($opera)">$city</city>
```

Query multiple topic maps

Needs to be possible. Requires further elaboration.
Some ideas:

```
SELECT $opera
```

```
FROM opera.xtm, wagner.xtm, janacek.ltm
```

```
WHERE
```

```
    composed-by( $opera : opera, $composer : composer )?
```

```
FOR $opera IN opera.xtm, wagner.xtm, janacek.ltm
```

```
WHERE
```

```
    composed-by( $opera : opera, $composer : composer )?
```

```
FOR $opera IN opera.xtm FOR $opera2 IN puccini.ltm
```

```
WHERE
```

```
    . . .
```

Add support for non-existential queries

This still needs to be fleshed out...

```
SELECT $composer WHERE
```

```
WHERE
```

```
  composed-by( $opera : opera, $composer : composer ),
```

```
  EVERY $opera/premiere-date > "1900"
```

```
?
```

Constructors for TMs (1)

(Short problem description)

WHERE

```
$city : city,  
{ premiere($opera, $city) |  
  premiere($opera, $theatre) ,  
  located-in($theatre, $city) }  
ORDER BY $opera DESC?
```

Would normally return cities, operas, and theatres
...but no associations (or names or occurrences)

What should the TM contain in addition to those topics?

- premiere and located-in associations?
- names? types? locators?

Why not just specify exactly that...

Constructors for TMs (2)

(Simple solution example)

```
FOR $opera, $city, $theatre return all these topics
```

```
WHERE
```

```
  $city : city,  
  { premiere($opera, $city) |  
    premiere($opera, $theatre),  
    located-in($theatre, $city) }
```

```
ORDER BY $opera DESC?
```

```
RETURN
```

```
  $*/@bn,  
  premiere(),  
  $opera/premiere-date,  
  located-in()
```

plus:

- all basenames for these topics
- all premiere assocs of these topics
- all premiere-date occs (of these)
- all located-in assocs (of these)

Constructors for TMs (3)

(variant for all associations and all basenames/occurrences)

```
FOR $opera, $city, $theatre return all these topics
```

```
WHERE
```

```
  $city : city,  
  { premiere($opera, $city) |  
    premiere($opera, $theatre),  
    located-in($theatre, $city) }
```

```
ORDER BY $opera DESC?
```

```
RETURN
```

```
  * () ,  
  $opera/* ,  
  $city/* ,  
  $theatre/*
```

plus:

- all assocs involving these topics
- all occs & bns of these topics
- all occs & bns of these topics
- all occs & bns of these topics

Constructors for TMs (4)

Transformation to another ontology:

```
FOR $opera, $city
```

```
WHERE
```

```
  $city : city,
```

```
  { premiere($opera, $city) |
```

```
    premiere($opera, $theatre),
```

```
    located-in($theatre, $city) }
```

```
ORDER BY $opera DESC?
```

```
RETURN
```

```
myOnt:first-performed($opera : myOnt:work, $city : myOnt:place)
```


Other stuff

In addition, retain the following from tolog:

- **prefixes** (namespaces for identifiers and locators)
- **modules** (user-defined predicates, functions, etc.)
- **inference rules**

Prefixes

Need a way to use namespaces for URIs, similar (but not necessarily identical) to that already in tolog:

```
USING opera FOR i"http://psi.ontopia.net/opera/"
USING geolang FOR i"http://psi.oasis-open.org/geolang/"
SELECT $city, count($opera)
WHERE
  $city : opera:city,
  { opera:premiere($opera, $city) |
    opera:premiere($opera, $theatre),
    geolang:located-in($theatre, $city) }
ORDER BY $opera DESC?
```

Unaddressed “weaknesses”

The following issues, identified as weaknesses in one or more of the prototype implementations, have not yet been addressed:

- Typing for primitive values (TMCL?)
- Scope (not yet fully cooked in this model)
- Set support (needs clarifying)
- Namespace declarations/identity syntax (not finalized)
- Integration of functions (not fully worked out)
- Transformation of TMs (not fully worked out)
- Non-existential queries (not fully worked out)
- Relationship to TMCL (not yet completely clear)

Schedule for further action

larsbot -> china (April 22 - May 18)

\rho does first draft in peace

WG3/TMQL-RG meets late summer (Montreal? Europe? Oslo?)

Target dates:

First WD submitted to SC34 by 2004/10/01

- In time for NB review prior to next SC34 meeting

Approved for CD ballot 2004/11

- Anticipated SC34 meeting in Nov/Dec 2004 timeframe

Second WD submitted by 2005/03/18

- In time for NB review prior to Spring 2005 meeting

Approved for FCD ballot 2005/05

- (Unless first ballot leads to extensive changes)