ADAPTING SEMANTIC MAPPINGS BETWEEN DYNAMIC BIOMEDICAL KNOWLEDGE ORGANIZATION SYSTEMS

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CONTEXT

Biomedical knowledge has a highly dynamic nature

> New versions of Knowledge Organization Systems (KOSs) including ontology, thesaurus, etc. are released periodically over time

KOSs need to be combined due to the domain size and to optimize coverage of the field

> **Semantic mappings** between KOSs are necessary

MAPPINGS

Semantic correspondences between entities belonging to different KOSs

> Consider KOS_A and KOS_B two KOSs where $KOS_A \neq KOS_B$, a mapping *M* is a triple (s, t, r) where $s \in KOS_A$, $t \in KOS_B$ and $r \in$ {exactMatch; broadMatch; narrowMatch; majorMatch; minorMatch}

OBJECTIVE

Define a formal framework to cope with the mapping adaptation problem between biomedical KOSs taking into account:

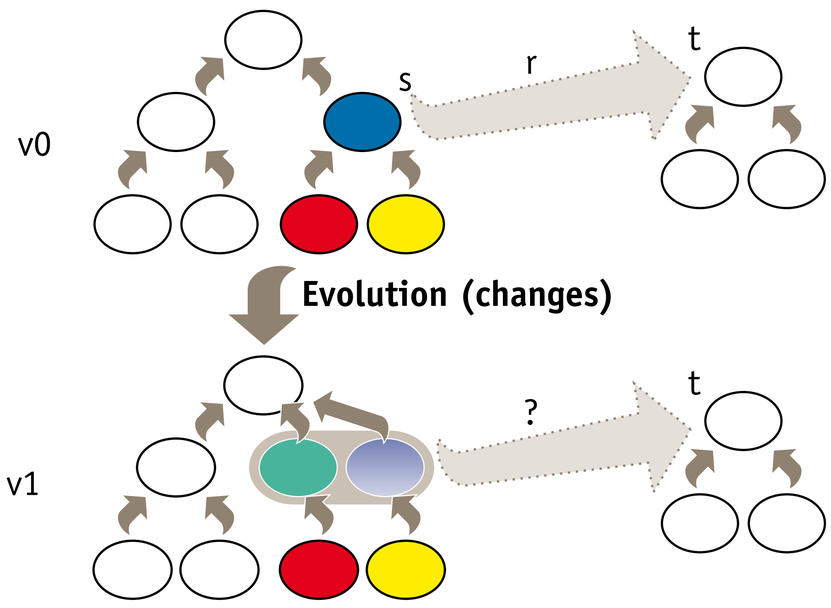
> Information about KOS evolution
> Semantic state of the current mappings
> Semantic mappings relations defined in the SKOS Mapping reference

PROBLEM

How to adapt semantic mappings impacted by KOS evolution without re-computing the whole set of mappings each time a KOS evolve?

MAPPING ADAPTATION

The modifications performed on the mappings established between KOSs in order to keep them valid when these KOSs evolve



A CHANGE PATTERN-DRIVEN APPROACH FOR MAPPING ADAPTATION

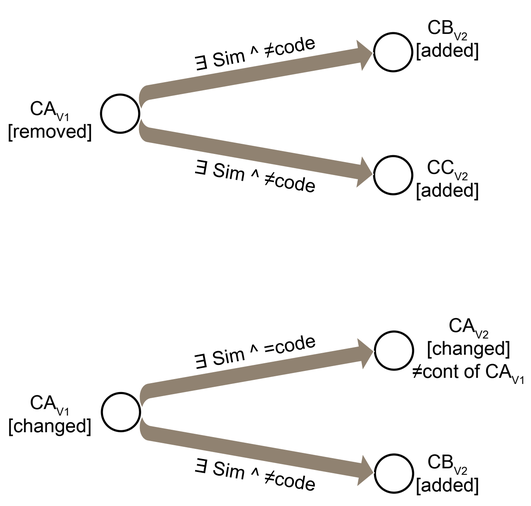
Capturing KOS Changes

Input: KOSs versions

> Identifying simple and complex change operations
> Determining change impact
> Combining change operations with their impacts leading to **change patterns**

Output: Change patterns instances

Example (Splits):



> **Expected Contribution:** Determination of change patterns for mapping adaptation

From Changes to Mapping Adaptation Actions

Input: Change pattern instances

> Combining necessary conditions as change patterns and mapping status
> Modeling and formalization of adaptation actions according to necessary conditions

Output: Heuristics

Example (Natural language):

"If s is involved within a change pattern Split {?x} and r of M is "exactMatch", then add the "broadMatch" relation between all t once linked to s"

> **Expected Contribution:** Mapping adaptation techniques for a mapping evolution mechanism

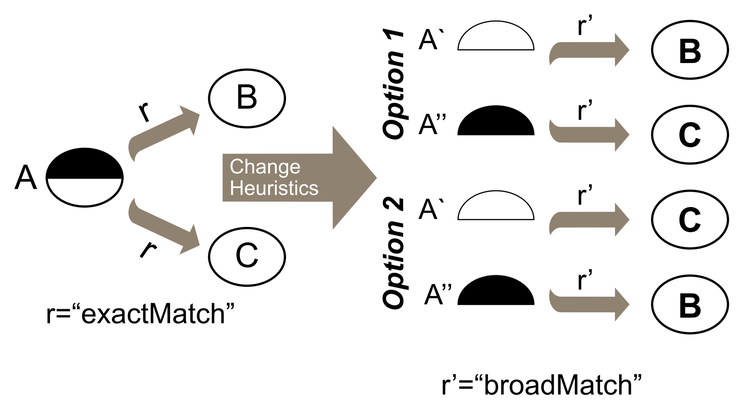
Mapping Evolution Mechanism

Input: Mappings and heuristics

> Assisted decision making based on the heuristics
> Operations for the implementation of the mapping adaptation actions

Output: Up-to-date mappings and mappings history

Example (Adaptation):



> **Expected Contribution:** A mapping evolution software tool implementing the whole approach