

# Using Semantic Mapping to Manage Heterogeneity in XLIFF Interoperability

by

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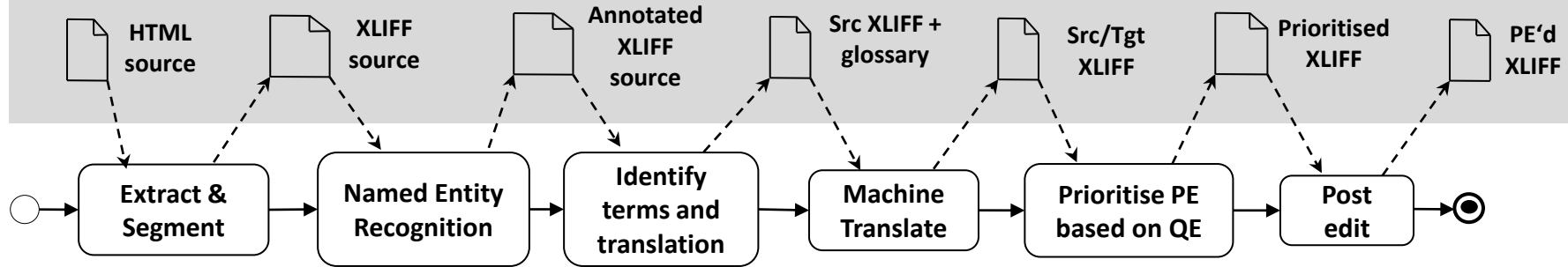
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# Outline

- Localization industry – interoperability issues
- Linked Data representation of localization content
  - Still has interoperability issues
- Language Technology retraining workflow - use case
- Our mapping representation
- Evaluation
- Conclusions

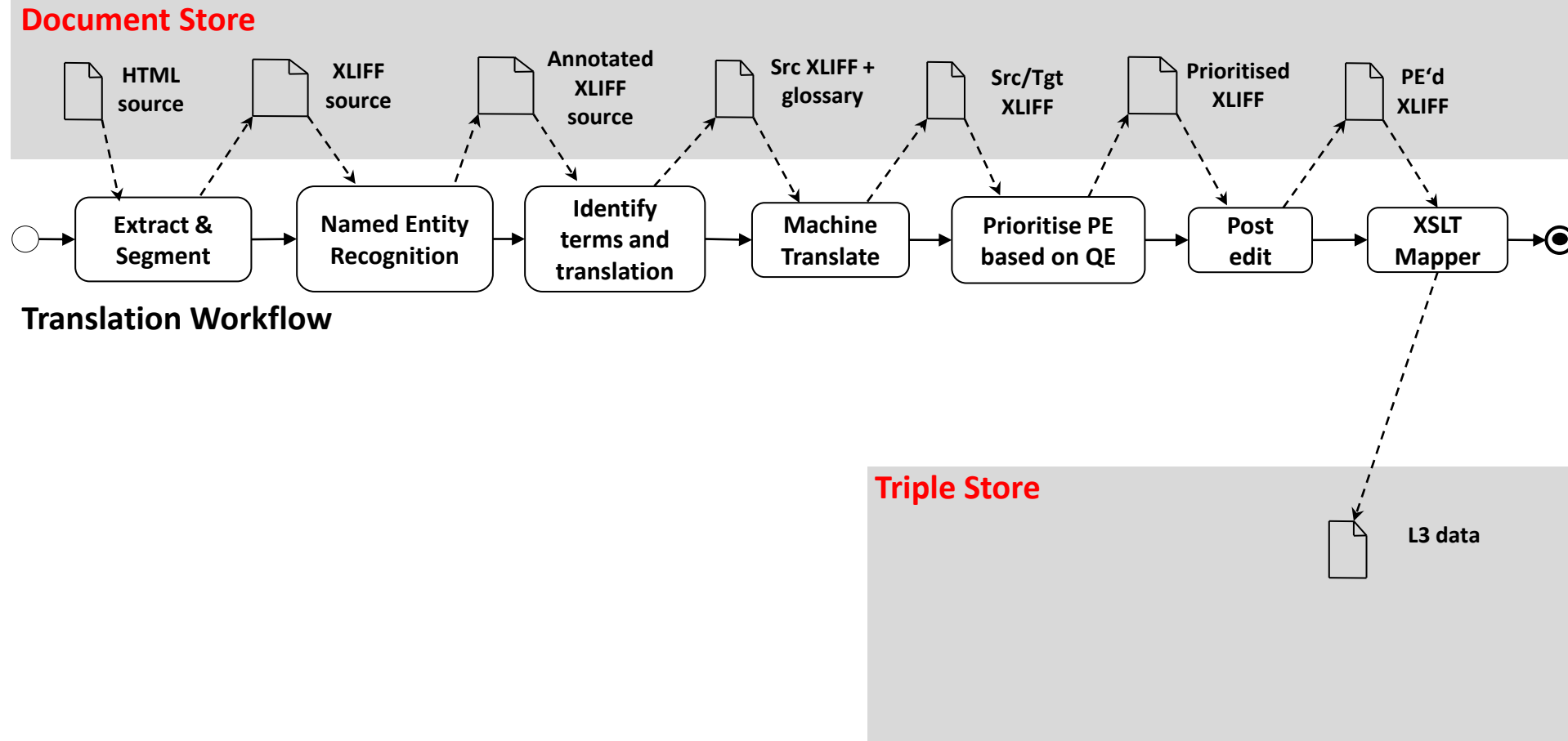
# Localization Industry

## Document Store



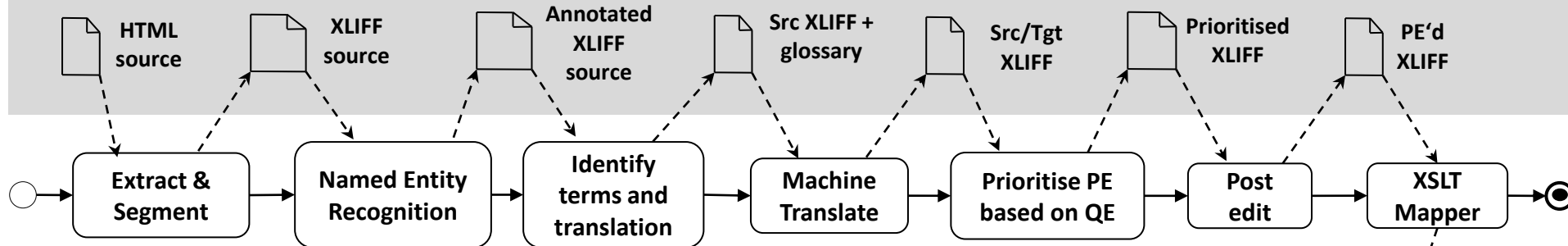
## Translation Workflow

# Linked Data Representation – L3 Data

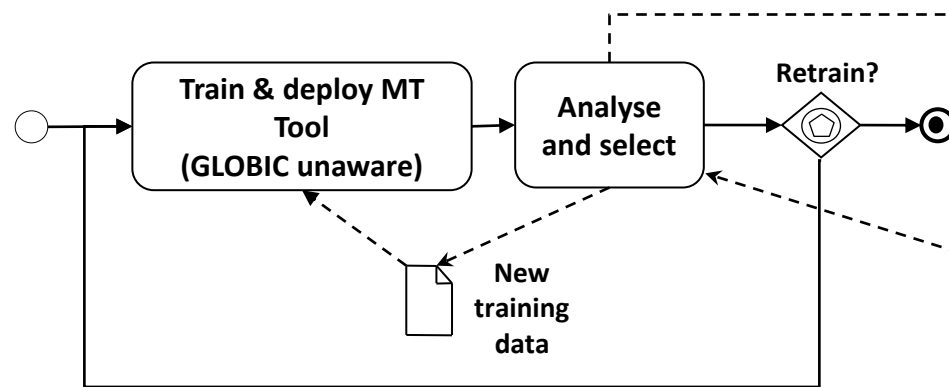


# LT Retraining Workflow

## Document Store

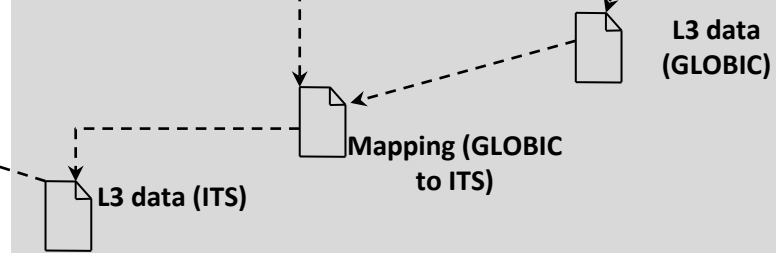


Translation Workflow

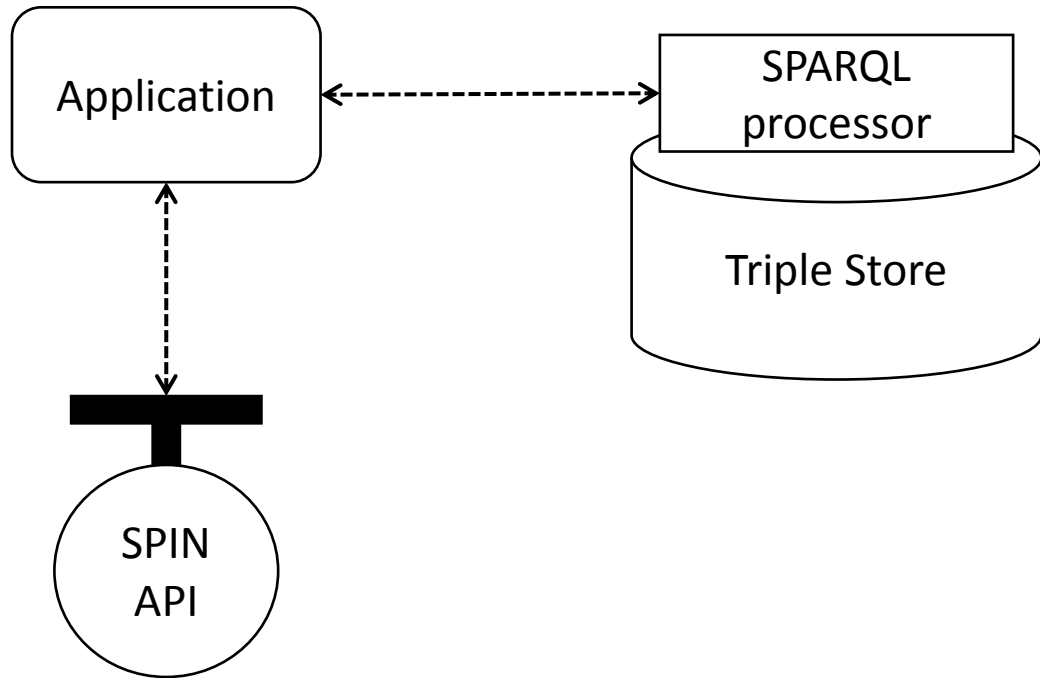


Retraining Workflow

## Triple Store



# Architecture Diagram of the Process



1. Application search for resources in the Triple Store
2. None in application's vocabulary, search for mappings
3. If mappings exist, then retrieve the SPIN representation
4. Convert the SPIN representation to SPARQL syntax via a call to the SPIN API
5. Execute the SPARQL query via the SPARQL processor
6. Consume the newly created data

# Mapping Requirements

1. A *mapping entity* must be expressed as RDF, with a unique URI, allowing it to be published as Linked Data
2. The *executable statement* must be a SPARQL query
3. The *executable statement* must be expressed as RDF and linked to a *mapping entity*
4. A *mapping entity* is to be modeled with associated meta-data

# Meta-data and SPIN

- Meta-data properties from the GLOBIC and W3C PROV vocabularies:

*gic:wasCreatedBy, gic:mapDescription, prov:generatedAtTime, prov:wasRevisionOf*

- SPIN vocabulary to express SPARQL queries as RDF:

## SPARQL Query

```
SELECT ?subject ?predicate ?object  
WHERE { ?subject ?predicate ?object }
```



## SPIN Representation

```
[] a sp:Select ;  
   sp:templates ([ sp:object _:b1 ;  
                  sp:predicate _:b2 ;  
                  sp:subject _:b3 ]);  
   sp:where ([ sp:object _:b1 ;  
              sp:predicate _:b2 ;  
              sp:subject _:b3 ]).  
_:b3 sp:varName "subject"^^xsd:string .  
_:b2 sp:varName "predicate"^^xsd:string .  
_:b1 sp:varName "object"^^xsd:string .
```



# Mapping Representation Example

## Mapping Entity + Meta-data

```
ex:globic_to_its_mtScore_map_1_1 a gic:Mapping ;
  gic:hasRepresentation ex:globic_to_its_mtScore_sp_2 ;
  gic:wasCreatedBy ex:person_1 ;
  prov:generatedAtTime "2014-01-01"^^xsd:date ;
  gic:mapDescription "Used to map MT confidence data from
    GLOBIC to ITS vobabulary" ;
  gic:version "1.1"^^xsd:float ;
  prov:wasRevisionOf ex:globic_to_its_mtScore_map_1 .
```

## SPIN Representation of SPARQL Query

```
ex:globic_to_its_mtScore_sp_2 a sp:Construct ;
  sp:templates ([ sp:object _:b1 ;
    sp:predicate itsrdf:mtConfidence ;
    sp:subject _:b2 ]) ;
  sp:where ([ sp:object _:b1 ;
    sp:predicate gic:qualityAssessment ;
    sp:subject _:b2 ]) .

_:b2 sp:varName "s"^^xsd:string .
_:b1 sp:varName "val"^^xsd:string .
```

# Evaluation

- Two initial experiments:

- 1. Test the mapping capabilities of SPARQL construct queries**

- R2R Framework – 70\* test mappings
- Reproduced R2R Evaluation
- R2R test mappings as SPARQL construct queries
- Compared results – SPARQL construct queries as expressive as R2R Framework

- 2. Test the expressiveness of SPIN vocabulary with regard to expressing SPARQL construct queries as RDF**

- Carried out using online SPIN RDF Converter and TopBraid composer
- Input the SPARQL construct queries from first evaluation
- SPIN could represent all queries in RDF
- Suitable vocabulary to use

# Conclusions

- Mapping representation to increase interoperability within heterogeneous workflows
- All aspects of mapping representation published as Linked Data
- Discovery of the mappings through SPARQL queries - ultimately executed through SPARQL processor
- Evaluation – Capabilities of SPARQL construct queries and expressiveness of SPIN
- Not just relevant to localization workflows, useful in other Linked Data scenarios

Thank You

Questions?