Discussion

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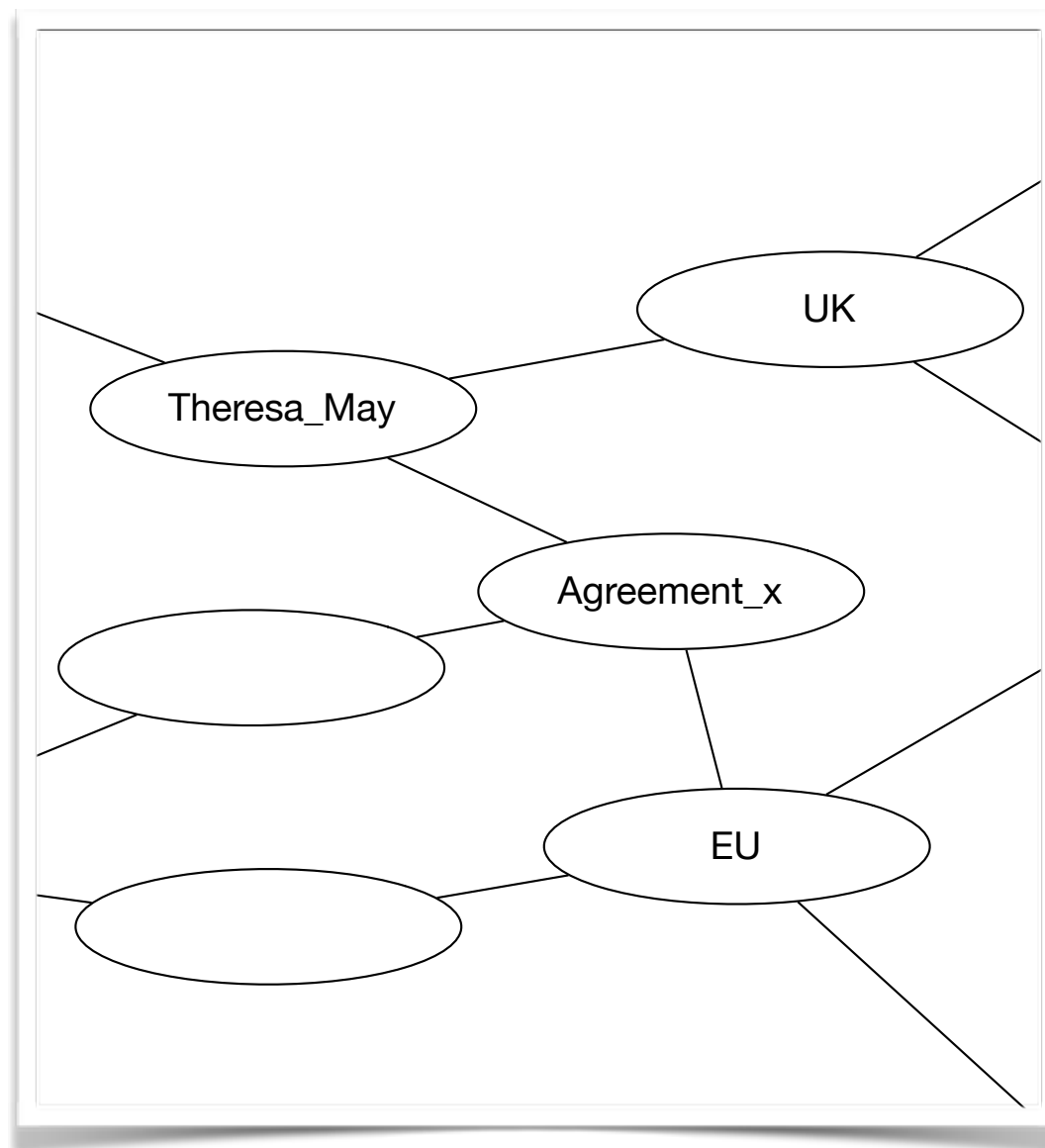Bloomberg L.P.

Outline

- Recap
  - end-to-end examples
  - outlook & open questions

- Q&A

- TREC CAR

Tying everything together

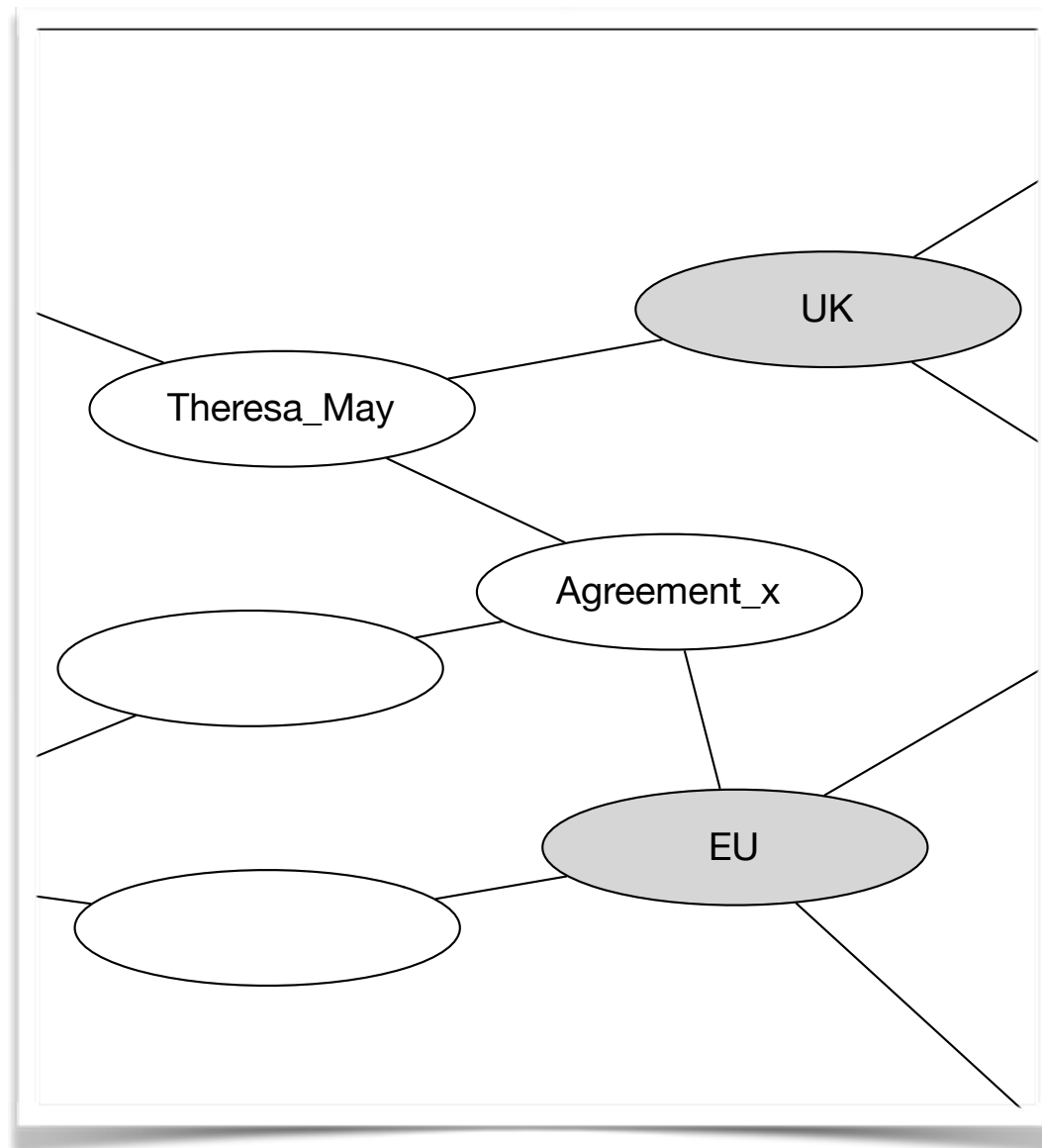- Entity linking/retrieval: $q \mapsto \{(e, s)_1, \ldots, (e, s)_n\}$

Tying everything together

- Entity linking/retrieval: $q \mapsto \{(e,s)_1, \ldots, (e,s)_n\}$

Tying everything together

- Q: "UK EU relationships"

Tying everything together

- Leverage obtained, possibly weighted, query relations and entities
  - as units of retrieval
  - to steer passage extraction
  - to guide a new round of retrieval
  - combine with document annotations
  - etc.

Clinical decision support

Query: 26-year-old <u>obese</u> <u>woman</u> with <u>bipolar disorder</u>, on <u>zolpidem</u> and <u>lithium</u>, with recent <u>difficulty sleeping</u>, <u>agitation</u>, <u>suicidal ideation</u>, and <u>irritability</u>
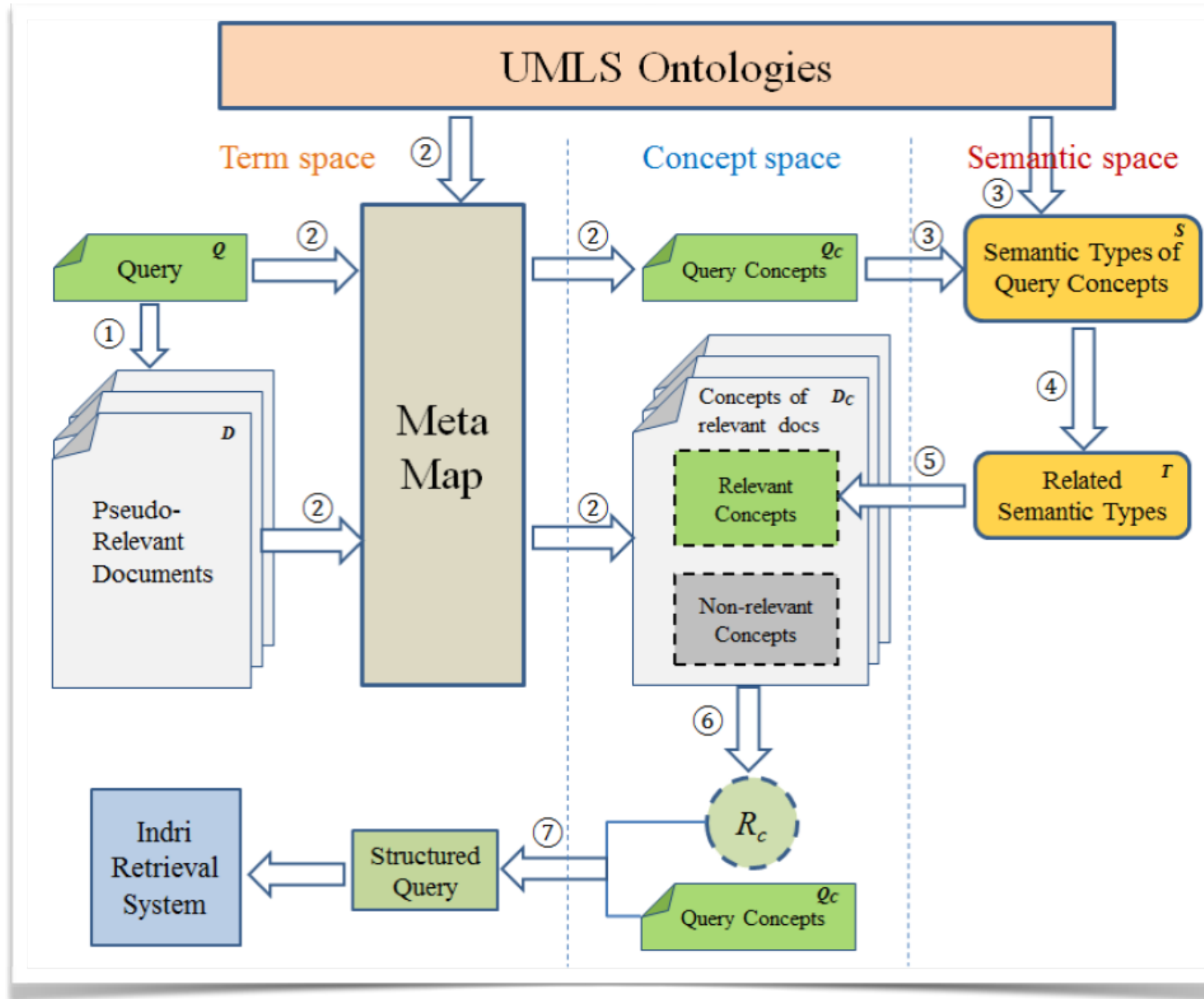
explicit concepts

CUI	concept	sem type
28754	obesity	disease or syndrome
42310	woman	population group
5586	biopolar disorder	mental or behavioral dysfunction
78839	zolpidem	pharmacologic substance
85631	agitation	sign or symptom

latent concepts

CUI	concept	sem type
743072	psychotic depression	mental or behavioral dysfunction
24713	manic disorder	mental or behavioral dysfunction
700201	dyssomnia	disease or syndrome
3887611	restlessness	sign or symptom

CDS systems

CDS challenges

- Verbose queries

- Large number of explicit and latent concepts

- Large and "dense" knowledge graph

Outlook / Open questions

- How to best use graph structure, e.g, exploiting both typed and untyped relations?

- Federated search and federated KGs: how to represent verticals, merge information, etc. Evaluation?

- Long-tail and out-of-KG entities. On the fly information extraction?

- KGs are not static things: how do you decide the KG does not contain the "required" information? Does it not exist or is the representation inaccurate/insufficient/…?

- Explainability: how did the system arrive at a ranking using KGs?

- Multi-linguality: documents, queries, KGs

- Moving beyond an "ad hoc" retrieval setting: how to represent users, tasks, and context?
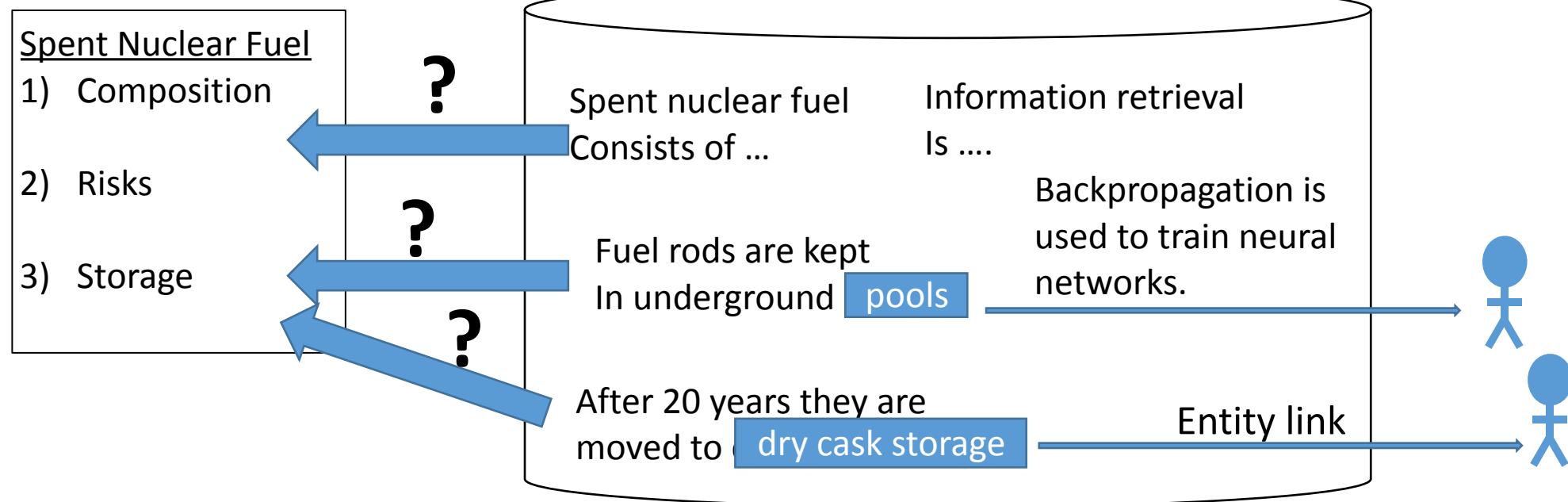
Q&A

TREC Complex Answer Retrieval (CAR)

- trec-car.cs.unh.edu

Given Outline (=Q)   Given a corpus of passages   with entity links

Spent Nuclear Fuel
1) Composition

2) Risks

3) Storage

?

?

?

Spent nuclear fuel
Consists of …

Information retrieval
Is ….

Backpropagation is
used to train neural
networks.

Fuel rods are kept
In underground pools

After 20 years they are
moved to dry cask storage

Entity link

Your task:
a) Which passages should go in this article?
b) Which section should they go in?

Wrap-up

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github.com/laura-dietz/tutorial-utilizing-kg/

Questionnaire: http://bit.ly/WSDM-IRKG