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Personal Knowledge Graphs: Use Cases in e-learning Platforms

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Introduction

Knowledge Graphs (KGs)

Personal Knowledge Graphs (PKGs)

E-learning use cases
1. collaborative search

2. e-learning platform

The problem

- Encyclopedic KGs do not contain personal data by nature
- Need for personalisation → LOD can help
- Push for digital transformation of education

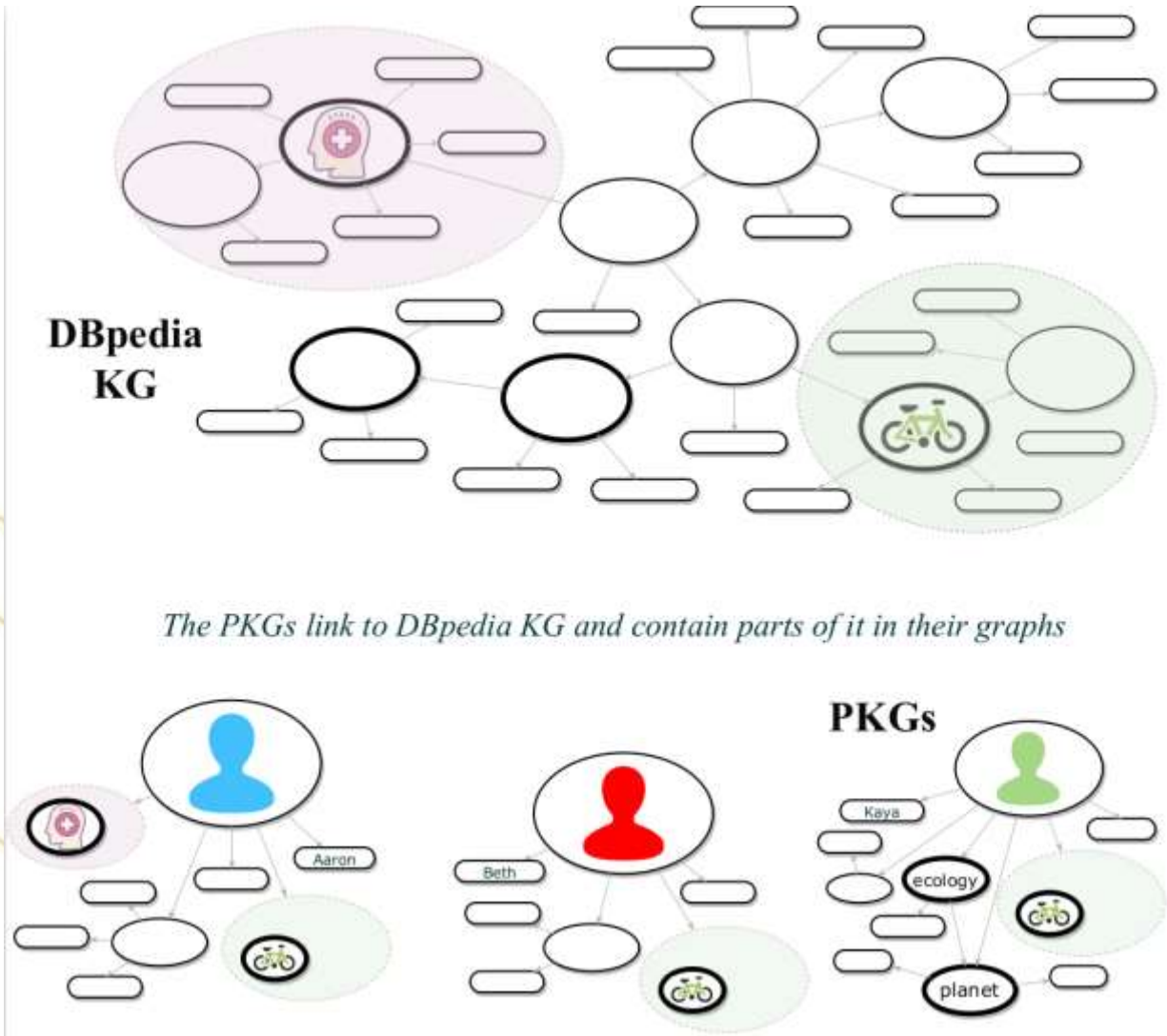
Solution → PKGs

- Small and user-centric

Good for exploring

- Users' patterns
- Collaborative features (group patterns)

Summary Example



Research Qs

- RQ1: How to syntactically and semantically represent a PKG in the e-learning domain?
- RQ2: How can e-learning platforms offer better semantically enhanced personalised features, such as semantic recommendations, with the usage of PKGs?
- RQ3: How can collaborative search learning environments offer more personalised features with the usage of PKGs?
- RQ4: Can collaborative learning platforms offer better collaboration with the usage of PKGs?

State of the art

1. PKGs

Challenges raised from PIM[1]

Initial efforts in medical domain[2]

Personal Knowledge Graph Summarization [3,4]

2. Personalisation in e-learning → adaptive recommenders

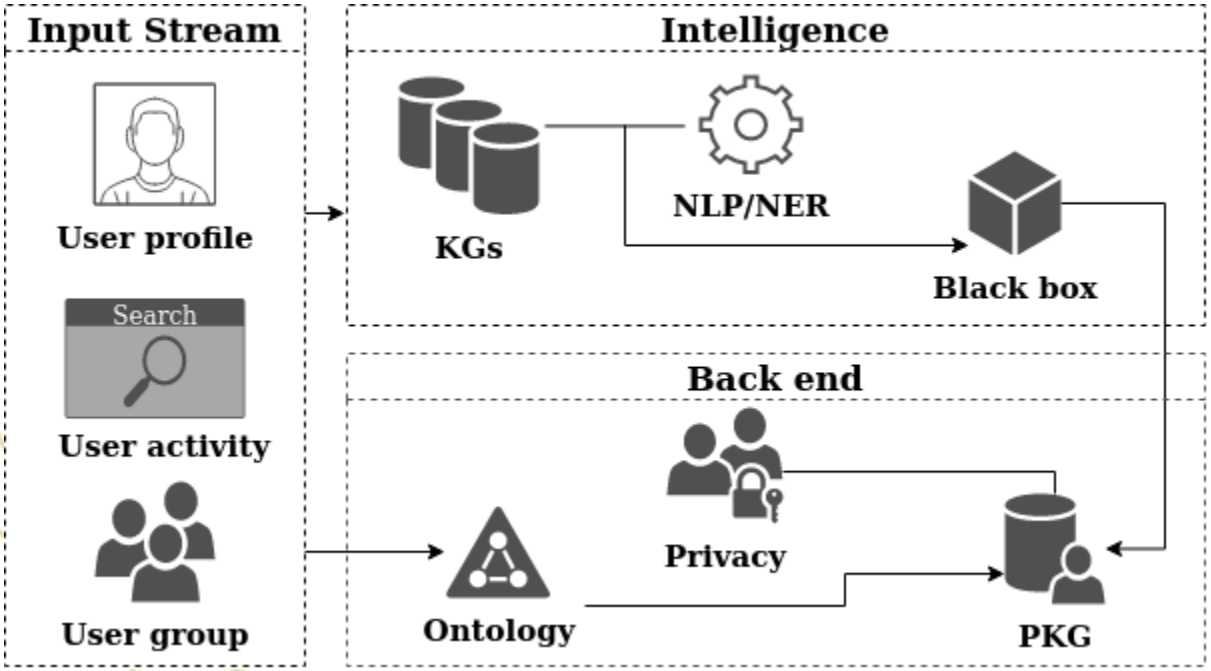
Symbolic:ontologies[5], semantic frameworks[6]

Subsymbolic "black-box": open learner model[7]

3. Collaborative Search and Learning (SaL)

Entity-centric[8]

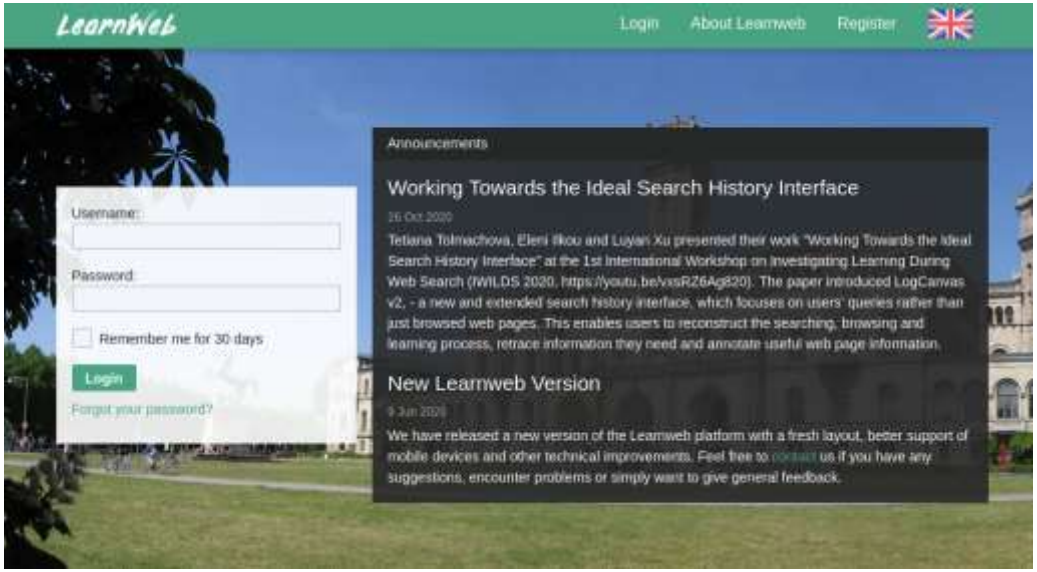
Approach Basis



An architecture for the creation of a PKG for a user in the back end of an e-learning system

Approach Cases

1. Collaborative Search



2. e-Learning platform

Opportunities and Challenges

+ PKGs promising new in this domain and problems

- Privacy, time dependent

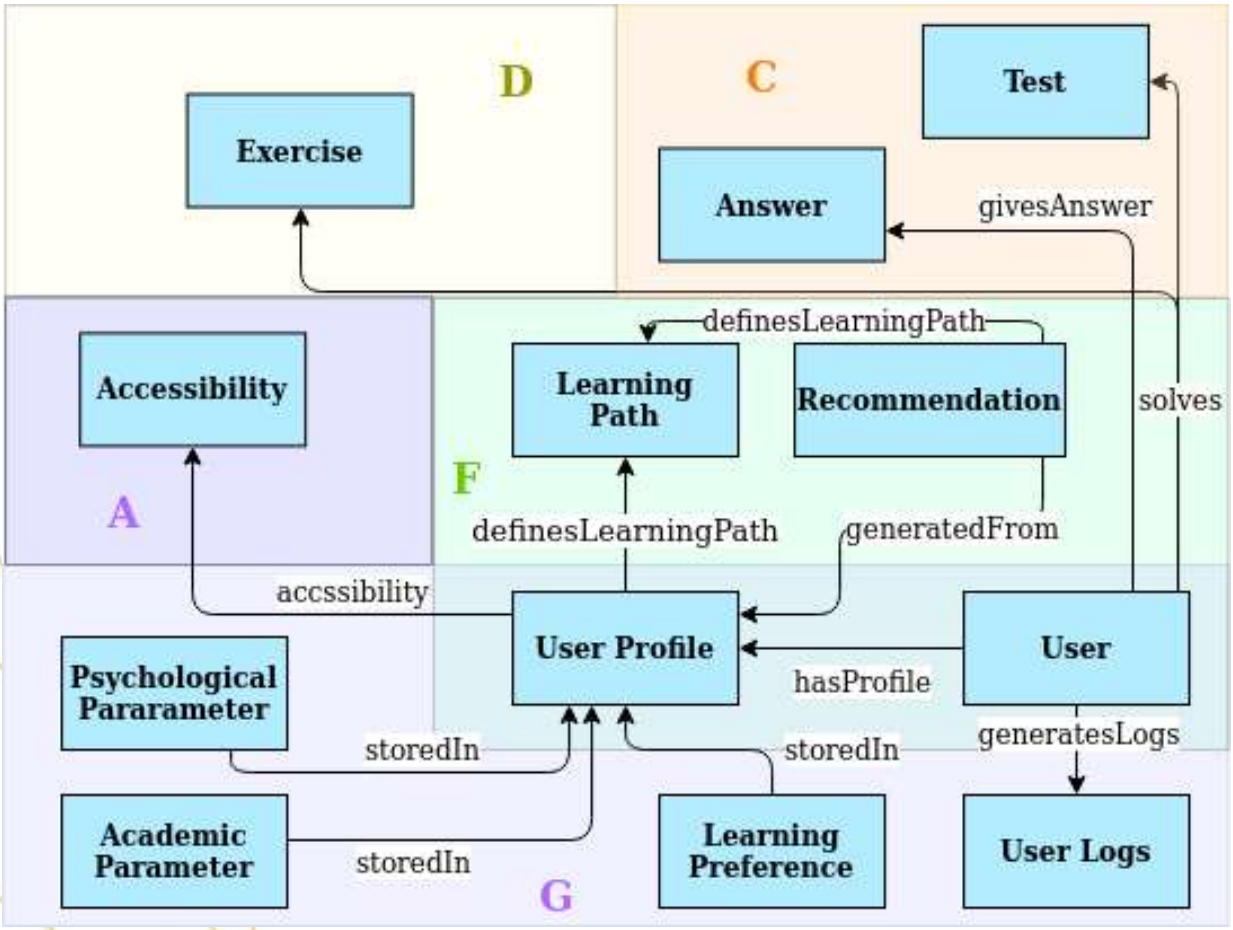
Methodology

Qualitative and quantitative

Human participants (interviews and questionnaires)

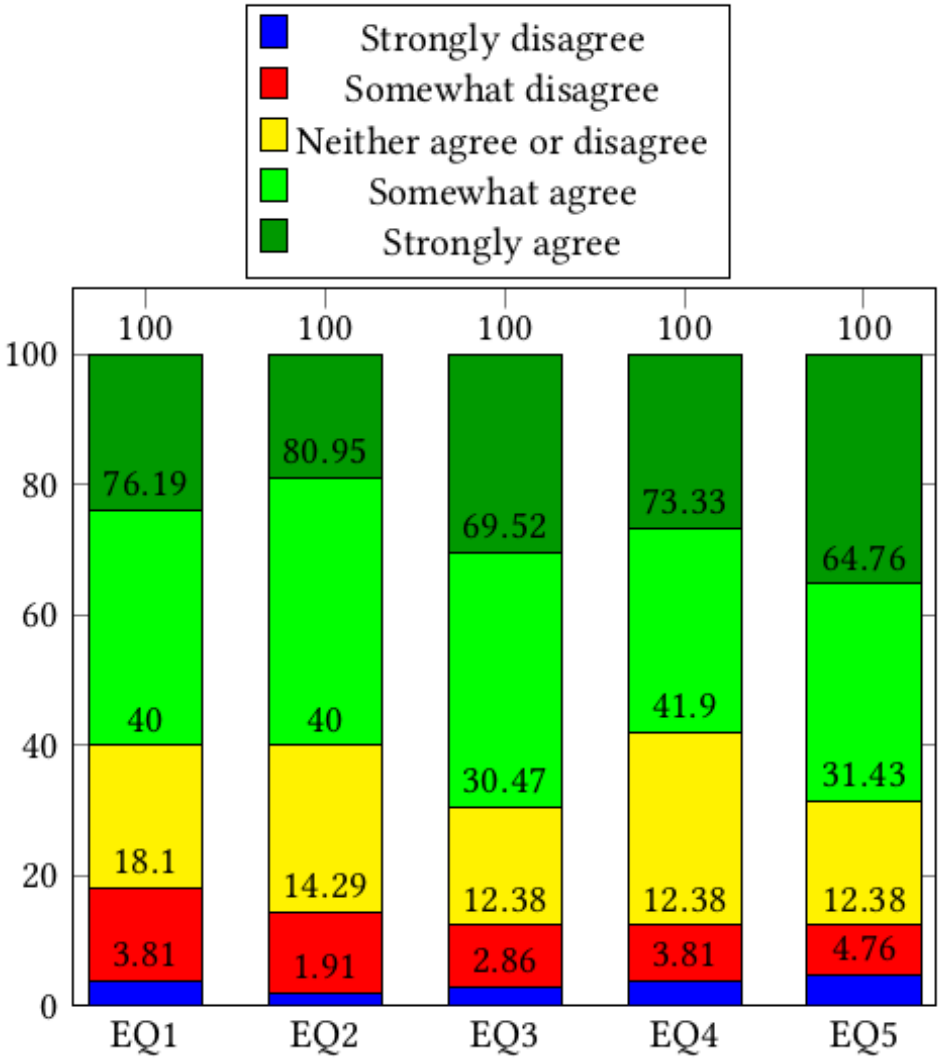
- No gold-standards or baseline metrics for collaborative search and SaL

Results so far



User Profile pattern from EduCOR[5] ontology

Results so far



User general feedback from CollabGraph [9].

EQ:"I like the"
1: the group results visualized in a graph,
2: the summary of the team-members results,
3: the graph visualizations
4: graph visualization next to the list view of the search results,
5: combination of the list and graph view.

Future Work

PKGs core

Knowledge Acquisition, maintaning, creation and update factors of PKGs

Privacy

E-learning applications

Semantic personalised recommendations

Annotations from tutors and direct feedback

Knowledge building spaces

Conclusion

PKGs small, user-centric KGs in the platform

Applications in educational domain: collaborative search and e-learning platforms

Benefits for platforms connected to knowledge bases

Promises for better personalisation and collaboration

Thank you!
Questions?

Contact me at ilkou@l3s.de

Preprint

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