Darmstadt Knowledge Processing Repository Based on UIMA

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Ubiquitous Knowledge Processing Group
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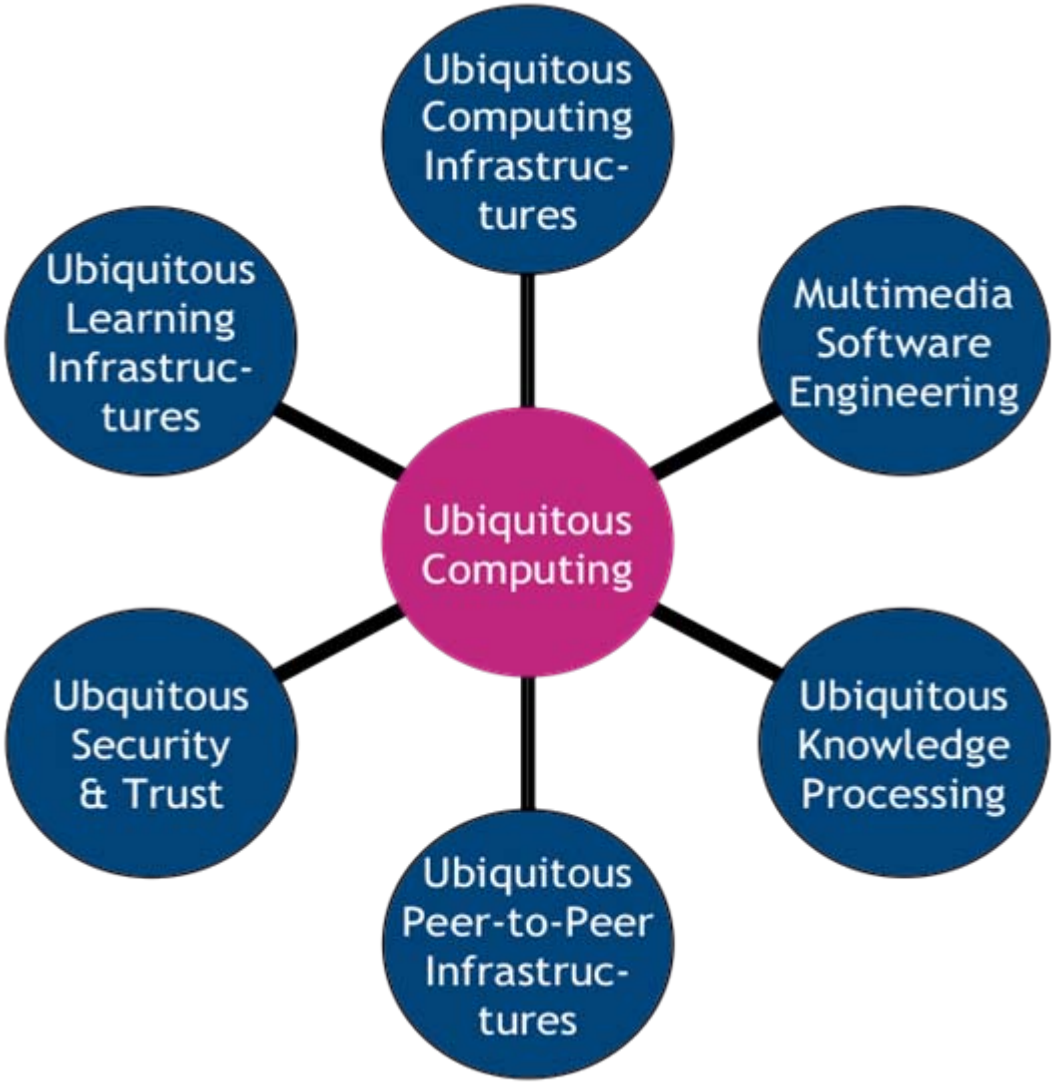
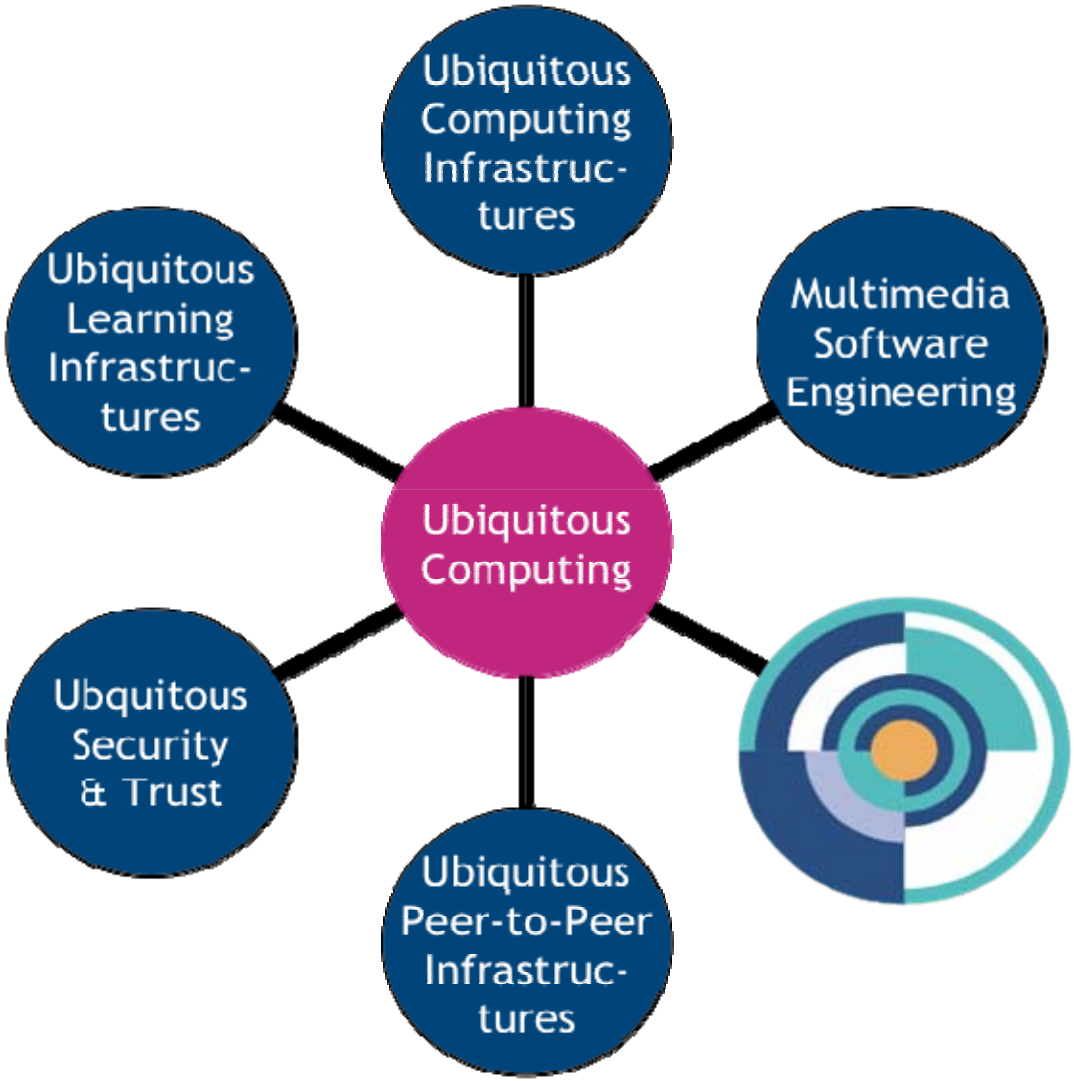
Telecooperation



Telecooperation



Ubiquitous Knowledge Processing

Ubiquitous Knowledge Processing





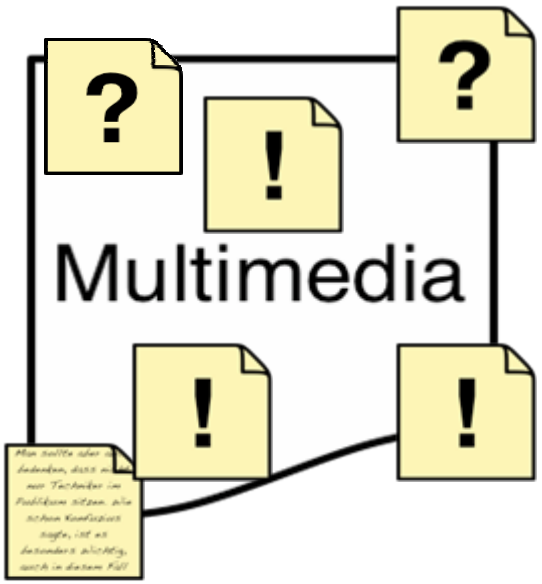
SIR

AQUA

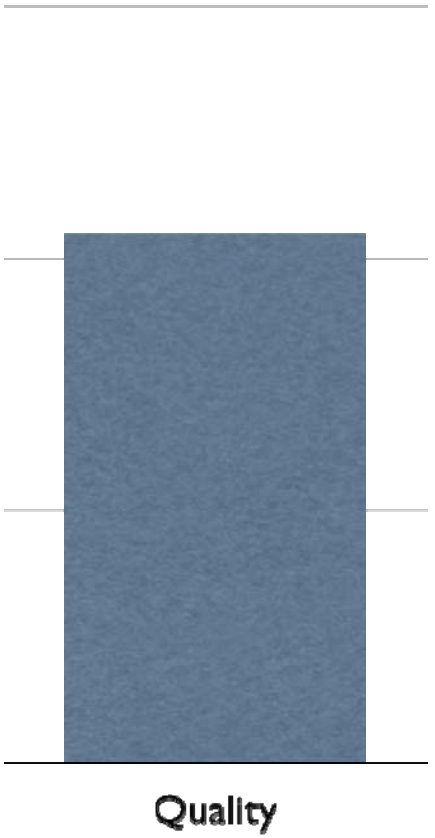
THESEUS

Darmstadt Knowledge Processing Software Repository

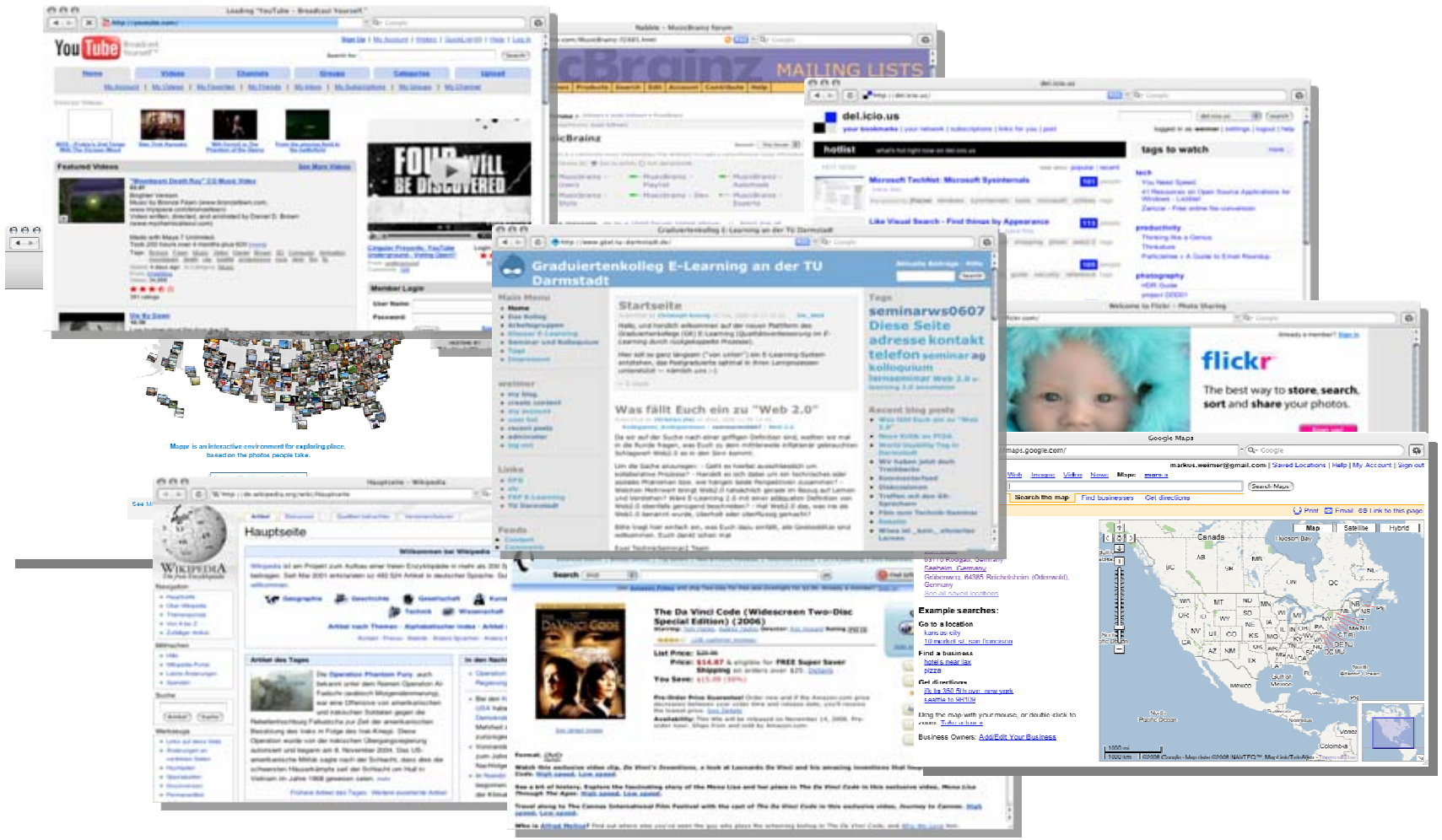
Automatic **Qu**ality **A**ssessment and Feedback in eLearning 2.0 (AQUA)



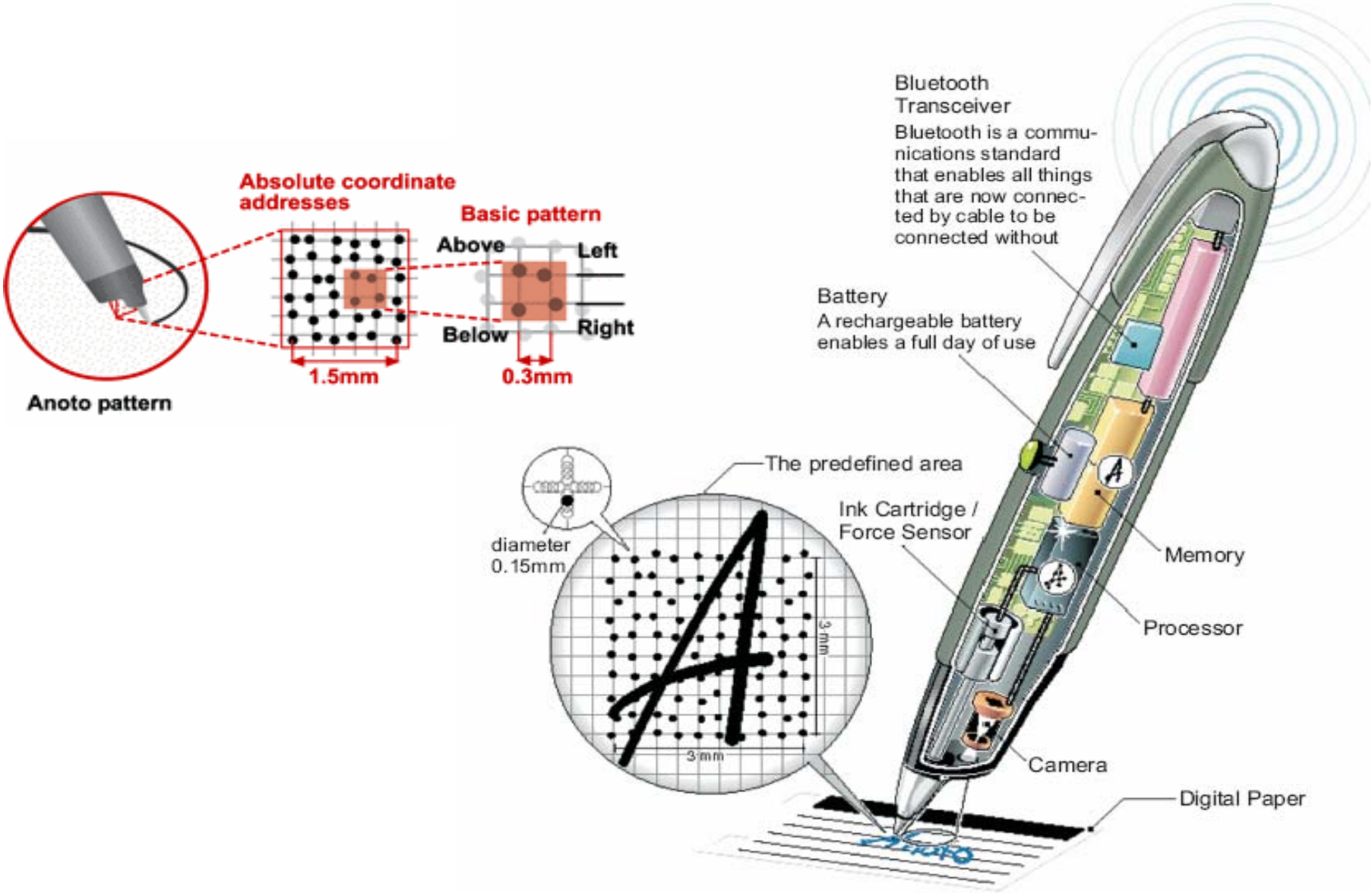
AQUA



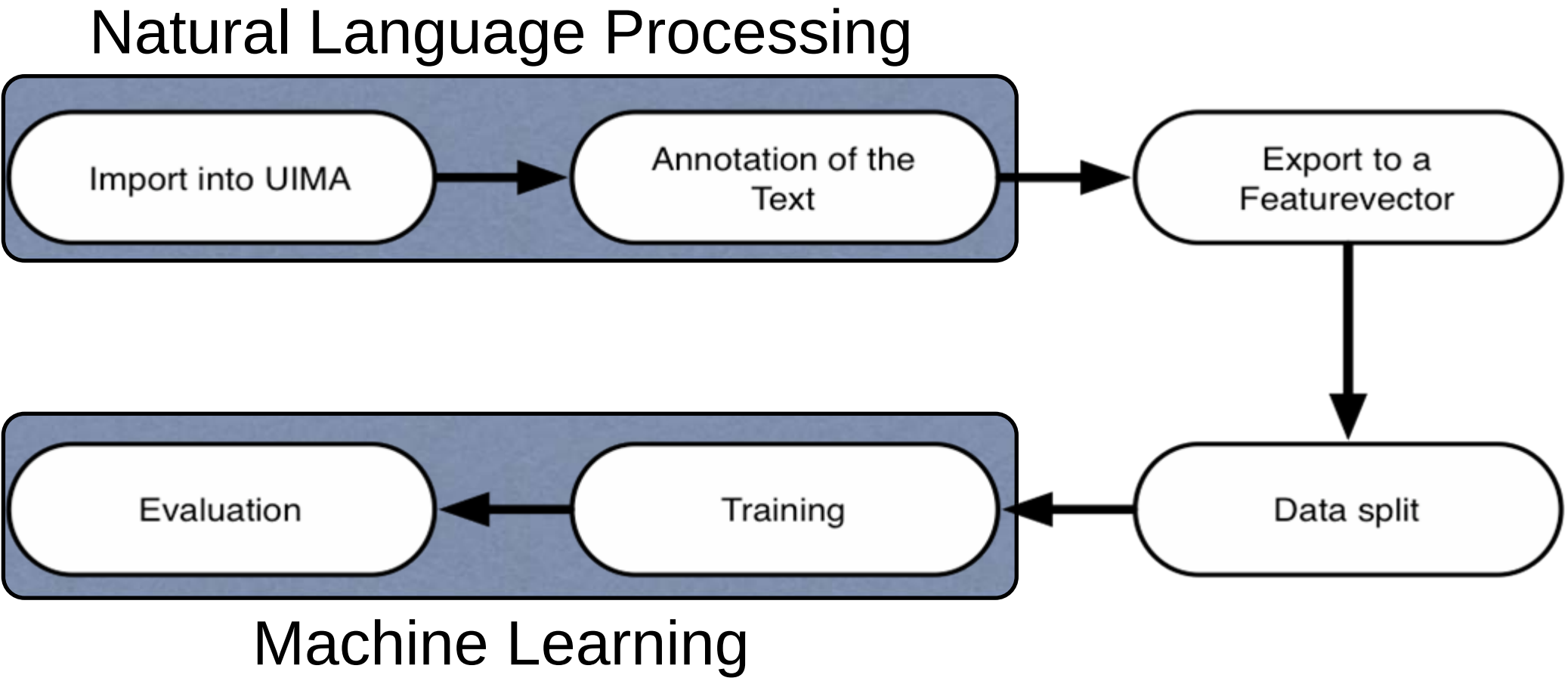
User Generated Discourse in Web 2.0



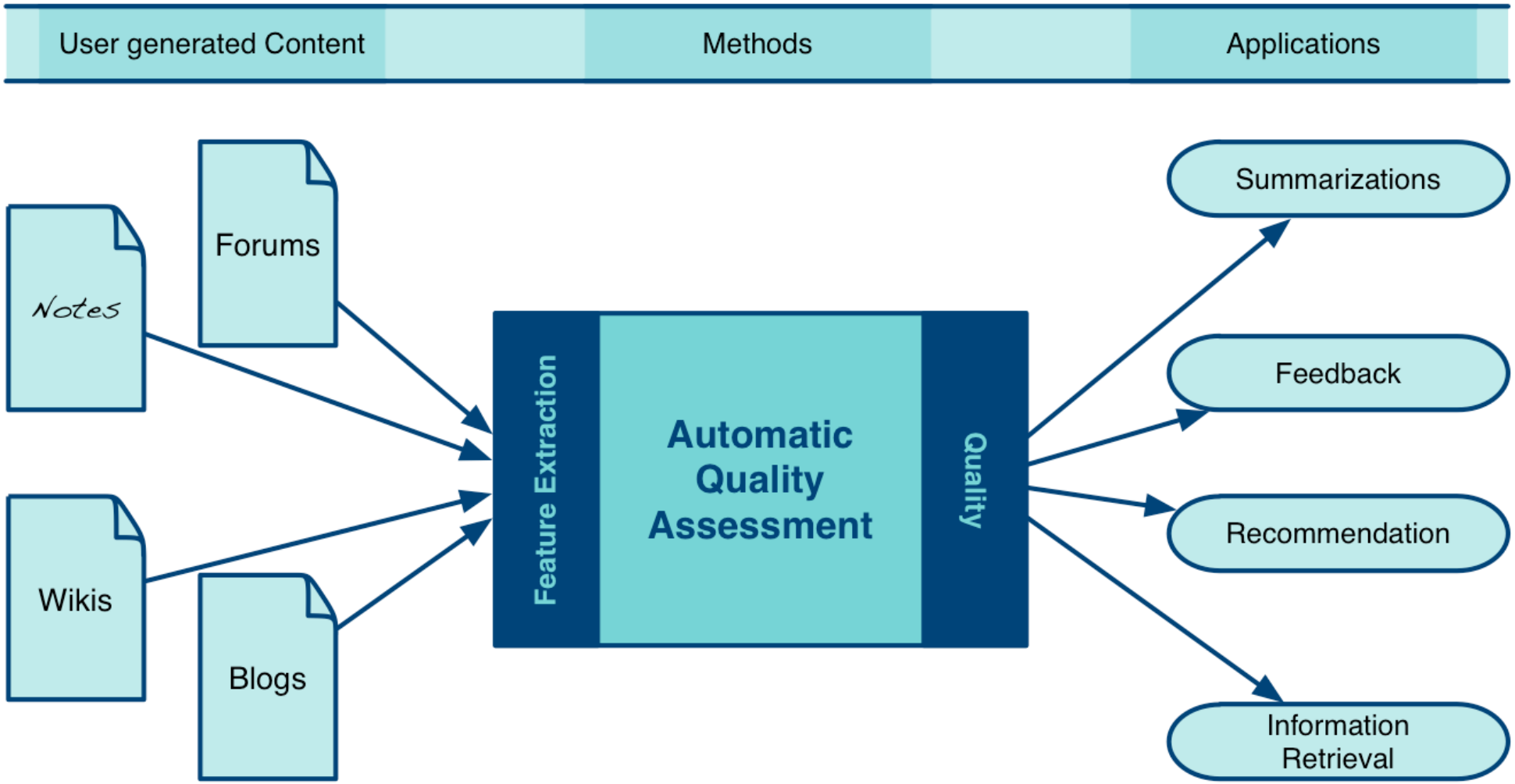
AQUA – Anoto pen



AQUA - System Architecture

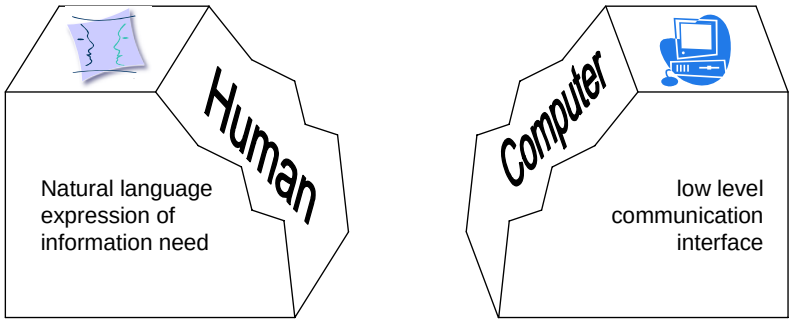


AQUA – System Architecture

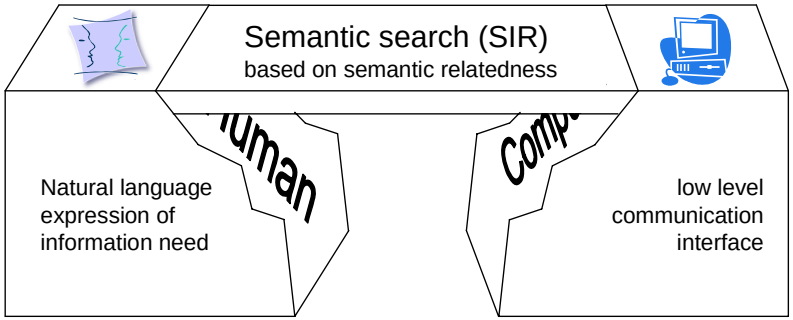


SIR (in cooperation with Prof. Hinrichs)

- Semantic Information Retrieval

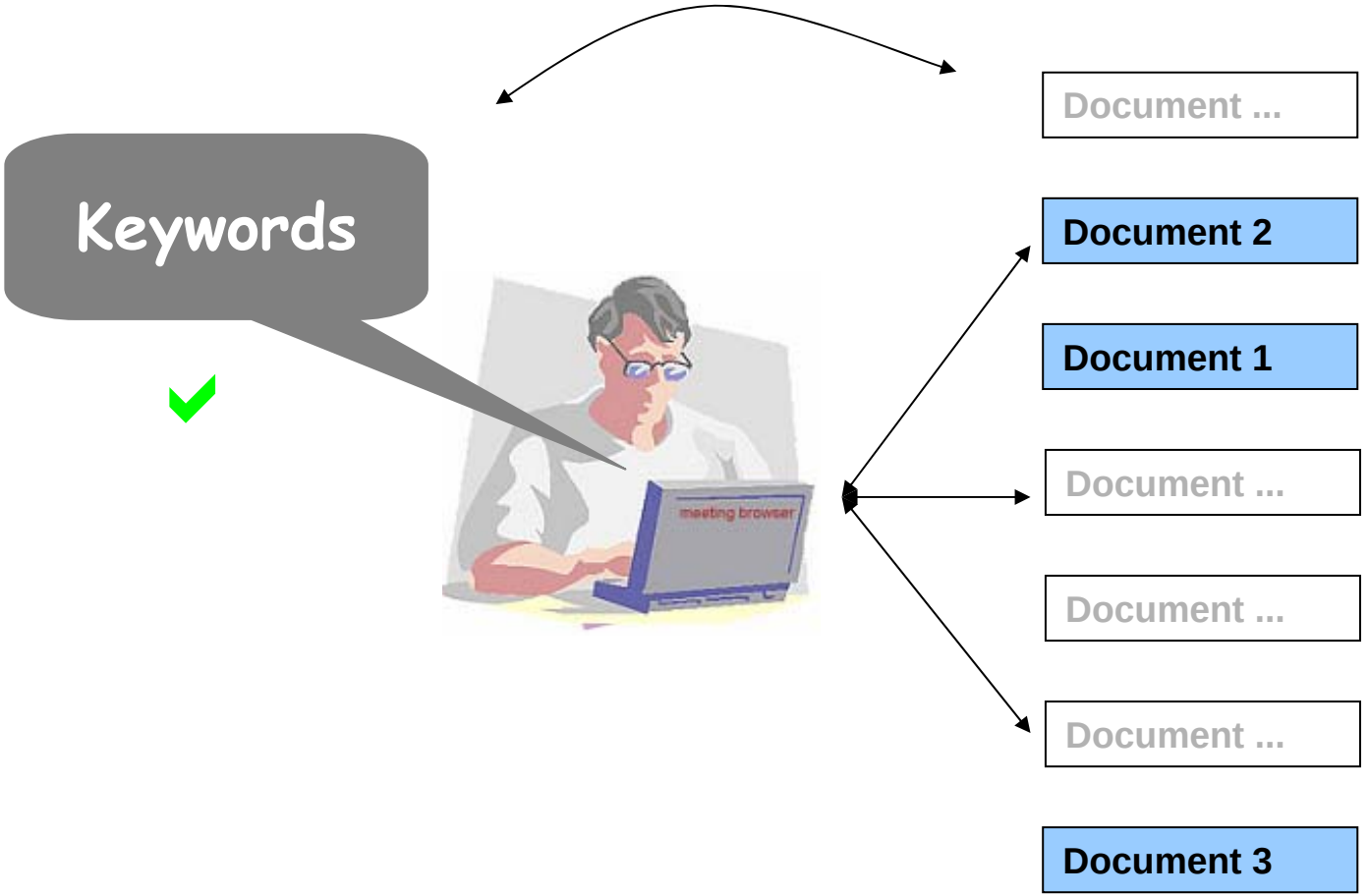


Bridge the human – computer gap



Information Retrieval (IR)

Boolean, Vector Space, ...



SIR-Project

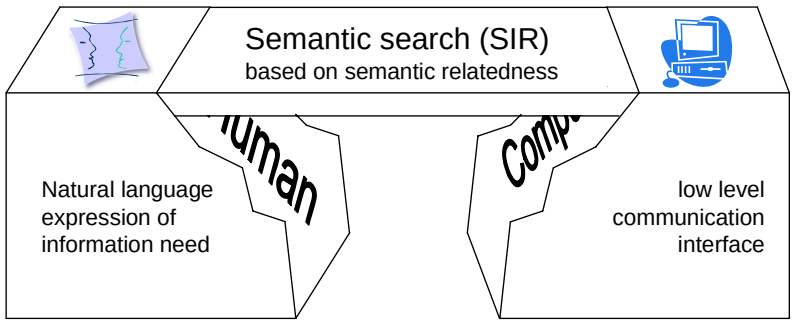
Semantic Relatedness

baker, to program, quality assurance

Essay

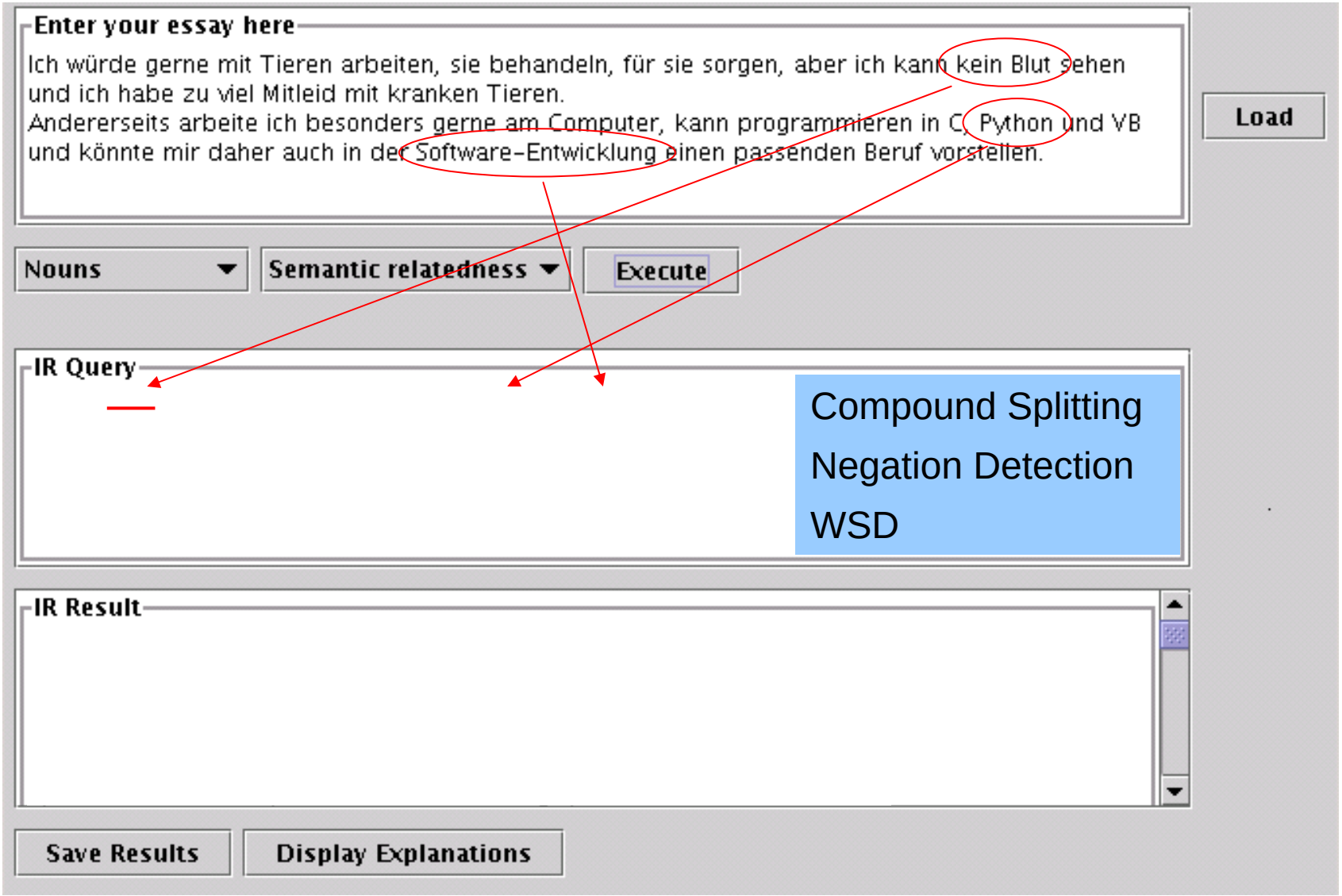
cake, computer, to read, ...

- Profession ...
- **Profession 2**
- **Profession 1**
- Profession ...
- Profession ...
- Profession ...
- **Profession 3**



SIR Example

find good index terms



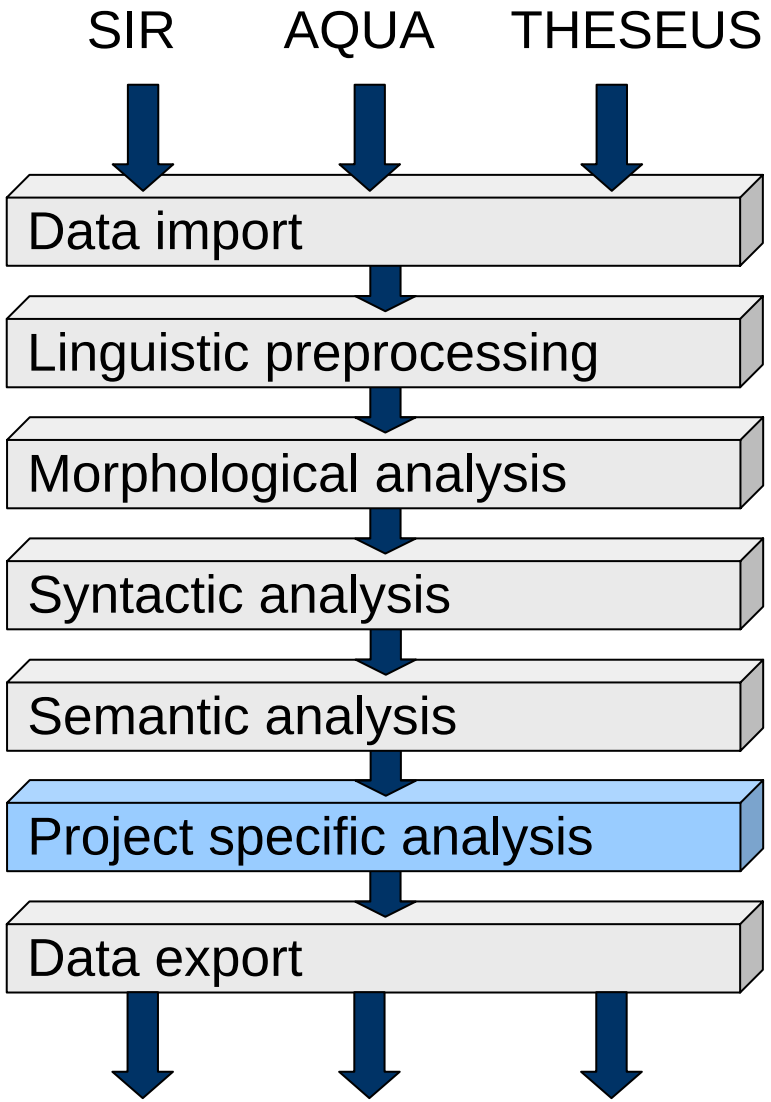
compute semantic relatedness

THESEUS - TEXO

- Large-scale BMBF-Project, industry (SAP, Siemens, etc.)
- Service Marketplaces in Web 2.0
  → Find services, both users and machines
- Problem:
  - Only keyword-based search
  - Lack of ontologies for semantic search
- Solution:
  - Use natural language descriptions of web services
  - Apply Semantic Information Retrieval
  - Community Mining for optimized service selection

  → Darmstadt Knowledge Processing Repository

UIMA components



Wikipedia reader, *Forum reader*, Plain text reader

Tokenizer, Sentence splitter, Stopword tagger

Stemmer, Lemmatizer, Compound Splitter

PoS-Tagger, *Parser*

NE tagger, Sentiment detector, WSD component

Swear word tagger (AQUA), *Negation detection (SIR)*

Indexer (Lucene, Terrier), *ARFF export*

Advantages of UIMA

- Components can be shared between projects
- Shared model of thinking
  - “Reader + Annotators + Consumer”
  - Configuration of components
- Descriptive component orchestration

Challenges

- Agree on a type system
  - No automatic type mapping
- Some rough edges in UIMA
  - No real plug’n’work with PEAR packages
  - Using constraints to align annotations seems to be slow


Wish list

- Automatic type matching
- Better tool support
  - Improving Eclipse plug-ins (robustness, features)
  - Refactoring of UIMA components
  - CPE runner ++ (automatic logging, performance monitor, etc.)
- Plug'n'work approach
- "Import by name" in CPEs
  - Or make ${CPM_HOME}/path also work for readers/consumers
- Construct XML descriptors from Java annotations
- More intuitive API

Thank you very much!

- Acknowledgements:
  - DFG for funding “Semantic Information Retrieval”
  - DFG for funding “Automatic Quality Assessment and Feedback in eLearning 2.0”

http://www.ukp.tu-darmstadt.de/

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Ubiquitous Knowledge Processing

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