

Towards Cloud-Based Knowledge Capturing Based on Natural Language Processing

 **RAGE** Realizing Applied Gaming Ecosystem
Realizing an Applied Gaming Eco-System

Christian Nawroth (University of Hagen)

Matthäus Schmedding (University of Hagen)

Holger Brocks (Research Institute for Communication and Cooperation, Dortmund)

Michael Kaufmann (Lucerne University of Applied Sciences and Arts)

Michael Fuchs (see below)

Matthias Hemmje (University of Hagen)

Michael Fuchs

Professor and Dean of Studies Software Engineering at

Wilhelm Büchner University of Applied Science, Darmstadt

HOLACONF - Cloud Forward 2015: From Distributed to Complete Computing

Content

1. Introduction and Motivation

- The RAGE Project
- Challenges for **N**atural **L**anguage **P**rocessing (NLP)
- Two important questions

2. State of the Art and Technology

- Discovering Game Material
- Cloud-related Technologies

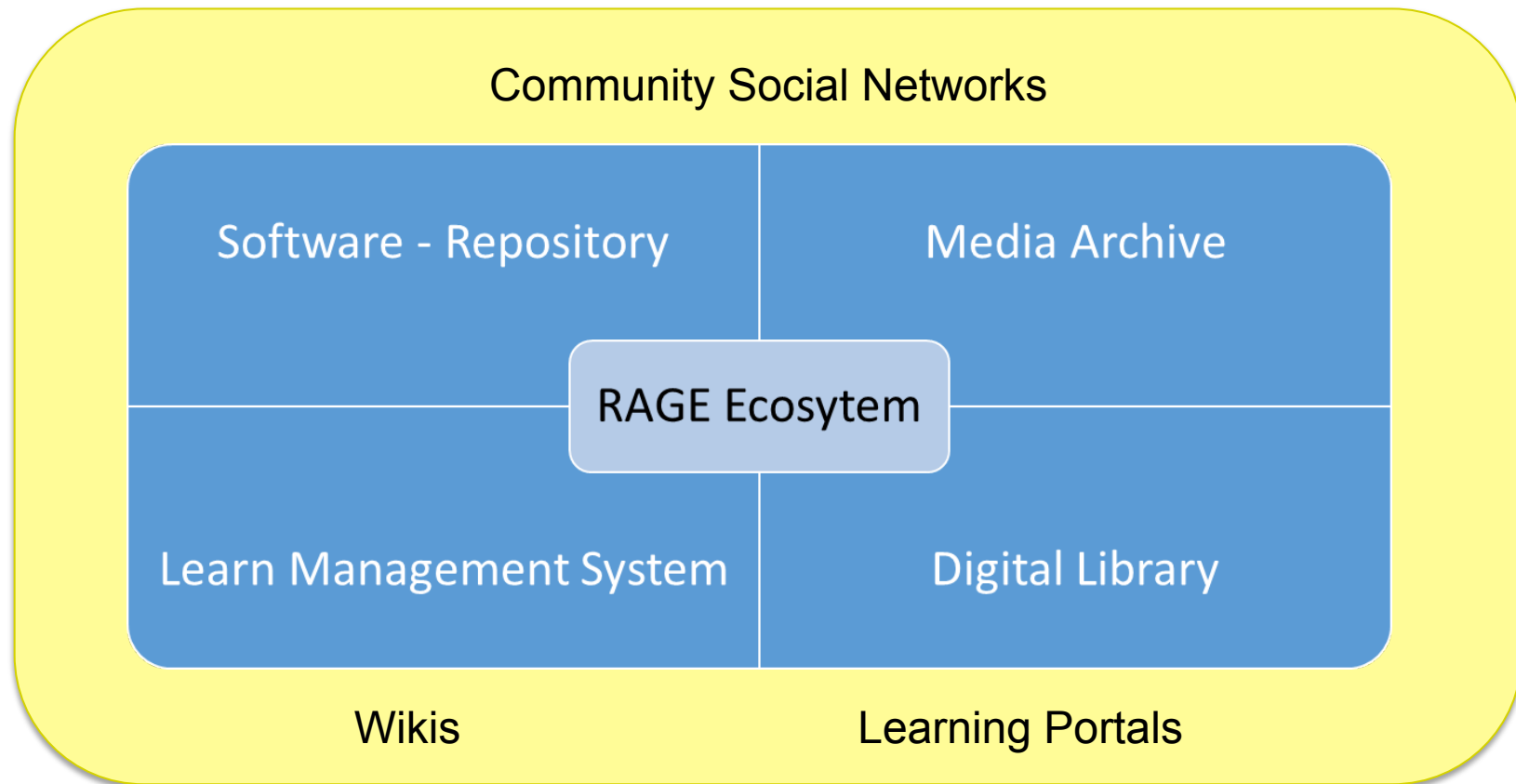
3. Cloud-based Solution

- Auto-capturing of RAGE Knowledge
- Sufficient resources for situation specific use
- Open issues

4. Conclusion

Introduction and Motivation The RAGE Project

EU funded project - start: February, 2015 – end January 2019



Introduction and Motivation

Challenges for the Natural Language Processing

- NLP used for *capturing knowledge* from *different* and *complex object types*
- This knowledge is used for *discovering game material* and for *feeding recommender systems*
- NLP needs one *common input format*
- NLP needs *rapid elasticity*

Introduction and Motivation

Two important questions

Question 1

How can Applied Gaming knowledge be captured and shared?

Question 2

How can cloud technology support this capturing and sharing?

State of the Art and Technology

Discovering Game Material

Sharing

- Traditional IR **keyword search**
- **Faceted Search** based on classification

Capturing via NLP (with 36 gaming categories)

- Named-entity recognition (**NER**)
 - **binary** (yes/no)
 - **weighted** (how often)
- Text classification based on Support Vector Machines (**SVM**)

State of the Art and Technology Cloud-related Technologies

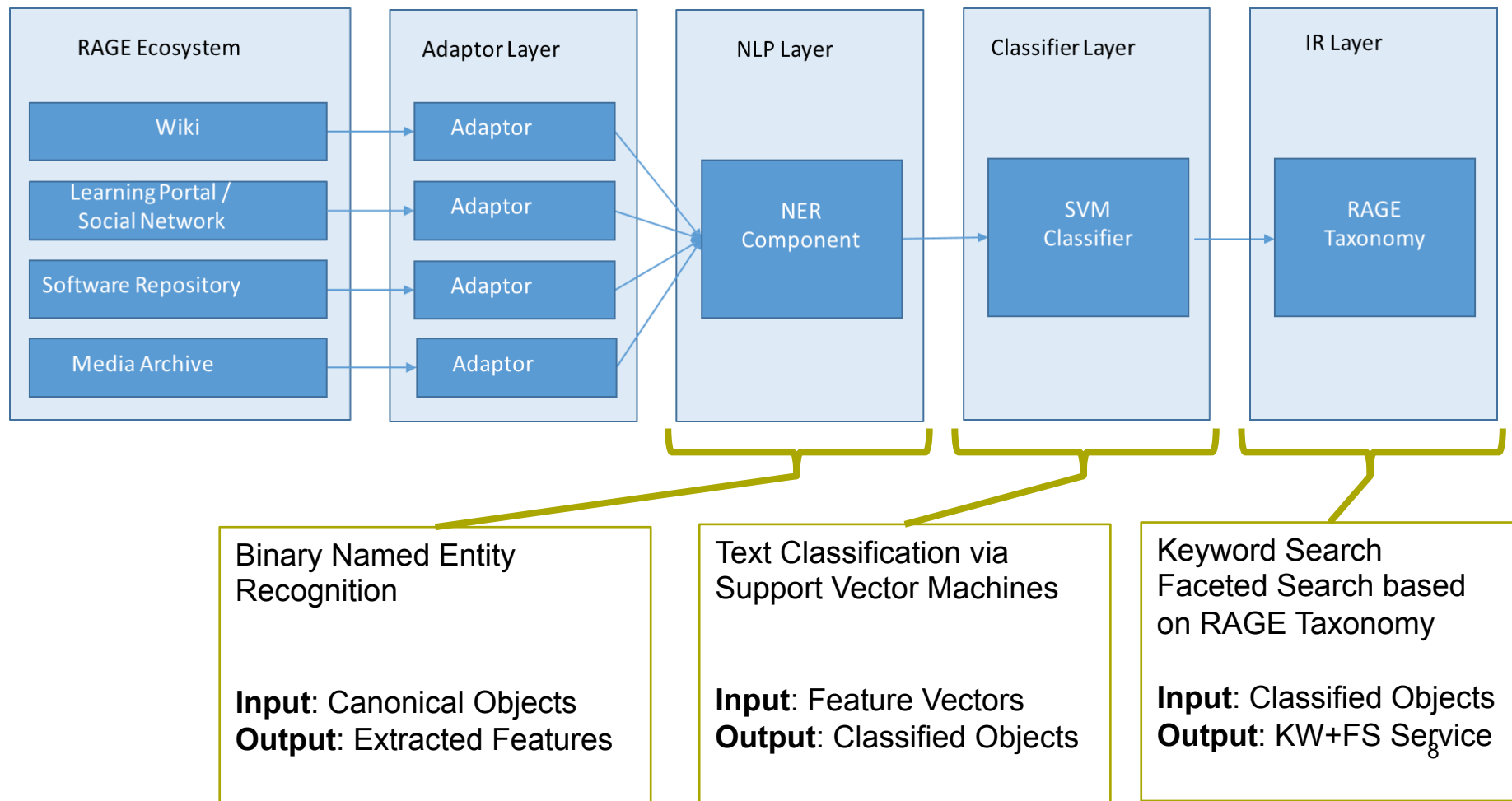
Multimedia Storage and Information Retrieval

- [Apache SolrCloud](#) for *keyword and faceted Search*
- [Amazon](#) for *multimedia repository*

NLP

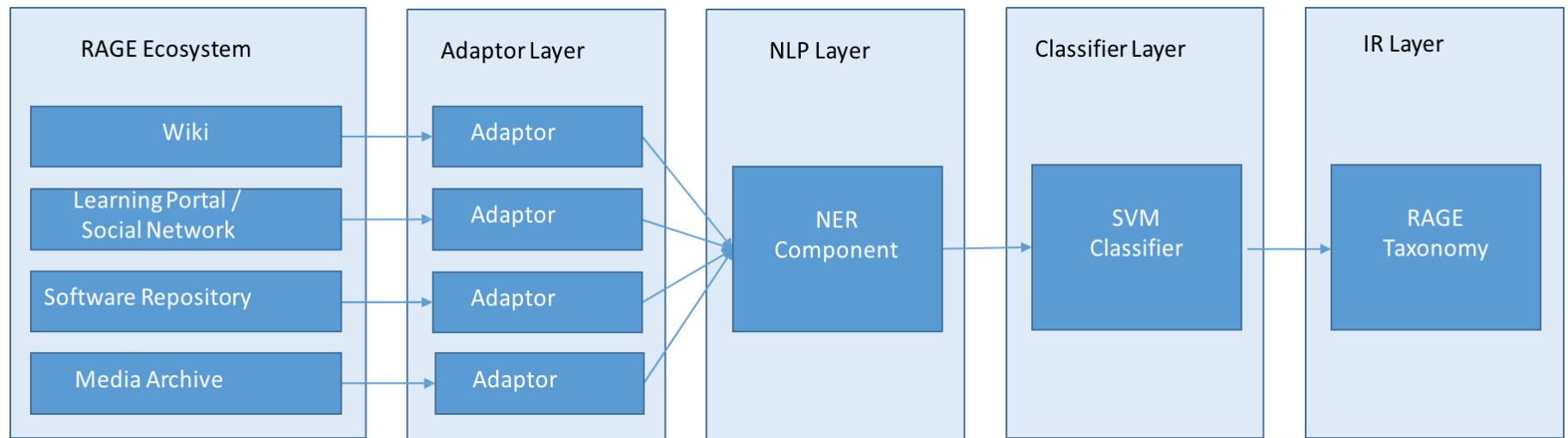
- [GATEcloud](#) for **NER+SVM**

Cloud-based Solution Auto-capturing of RAGE Knowledge



Cloud-based Solution

Sufficient resources for situation specific use



NIST Service Model

→ SaaS

Deployment

→ Public Cloud (Amazon)

→ Community Cloud

Task (supported resources)

→ Multimedia storage + access

NIST Service Model

→ PaaS

Deployment

→ Public Cloud (GATECloud)

Task (supported resources)

→ NLP and Classification

NIST Service Model

→ SaaS

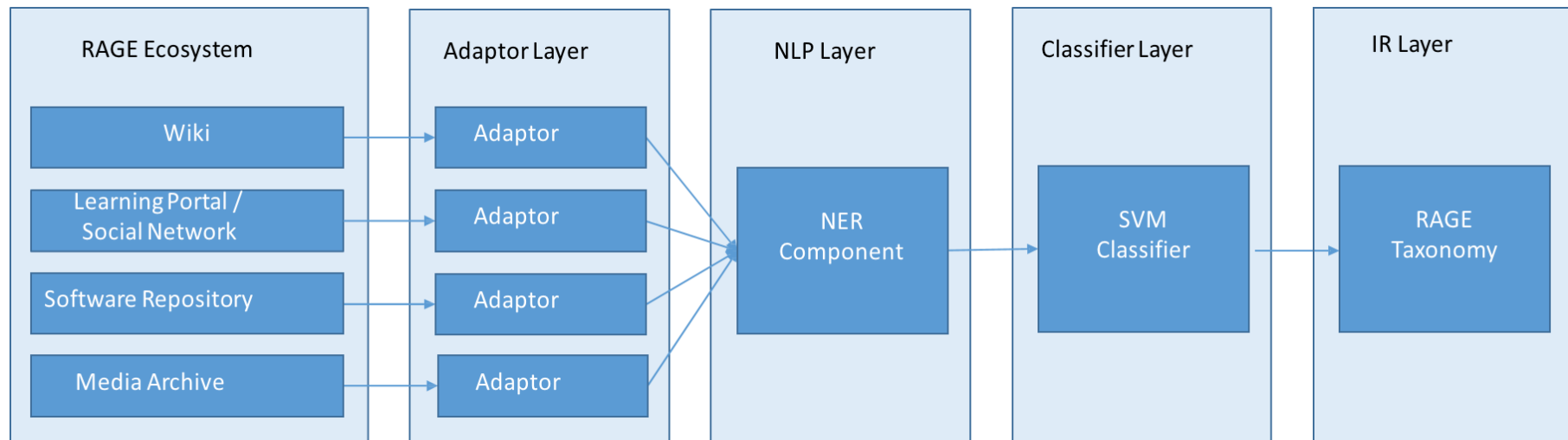
Deployment

→ Public Cloud (Apache SOLR)

Task (supported resources)

→ Index + Classify Storage

Cloud-based Solution Open issues



- Cloud to Cloud mediator
- Implemented as local service
- Integration of existing adaptors
- Transformed to SaaS (futur)

Conclusion

- RAGE is providing **knowledge-based** discovering possibilities
- Applied Gaming (**AG**) material need **huge storage space**
- **Amazon cloud** is used for storing all **binary objects**
- Knowledge needs to be **captured** from **different RAGE object types**
- For capturing, the **NER+SVM** cloud platform **GATEcloud** can be used
- The objects need to be **adapted** before – this implementation is a **RAGE project task** (at least for **game software assets**)
- Adapters could be implemented as **SaaS** (later)
- For sharing, **Apache SolrCloud** takes over

Towards Cloud-Based Knowledge Capturing Based on Natural Language Processing

 **RAGE** Realizing Applied Gaming Ecosystem
Realizing an Applied Gaming Ecosystem

**Thank you very much
for your attention!
Questions?**