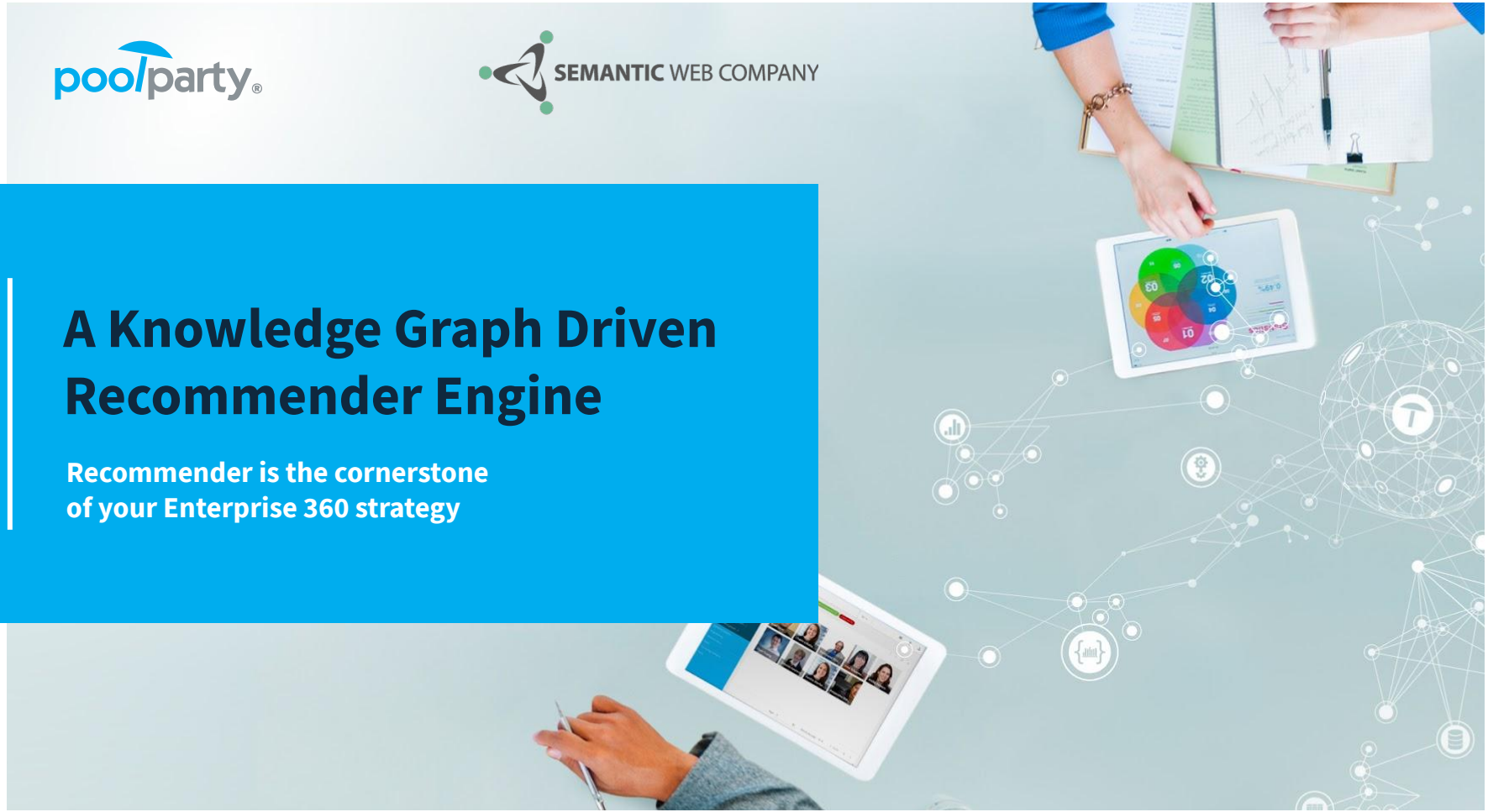
poolparty®

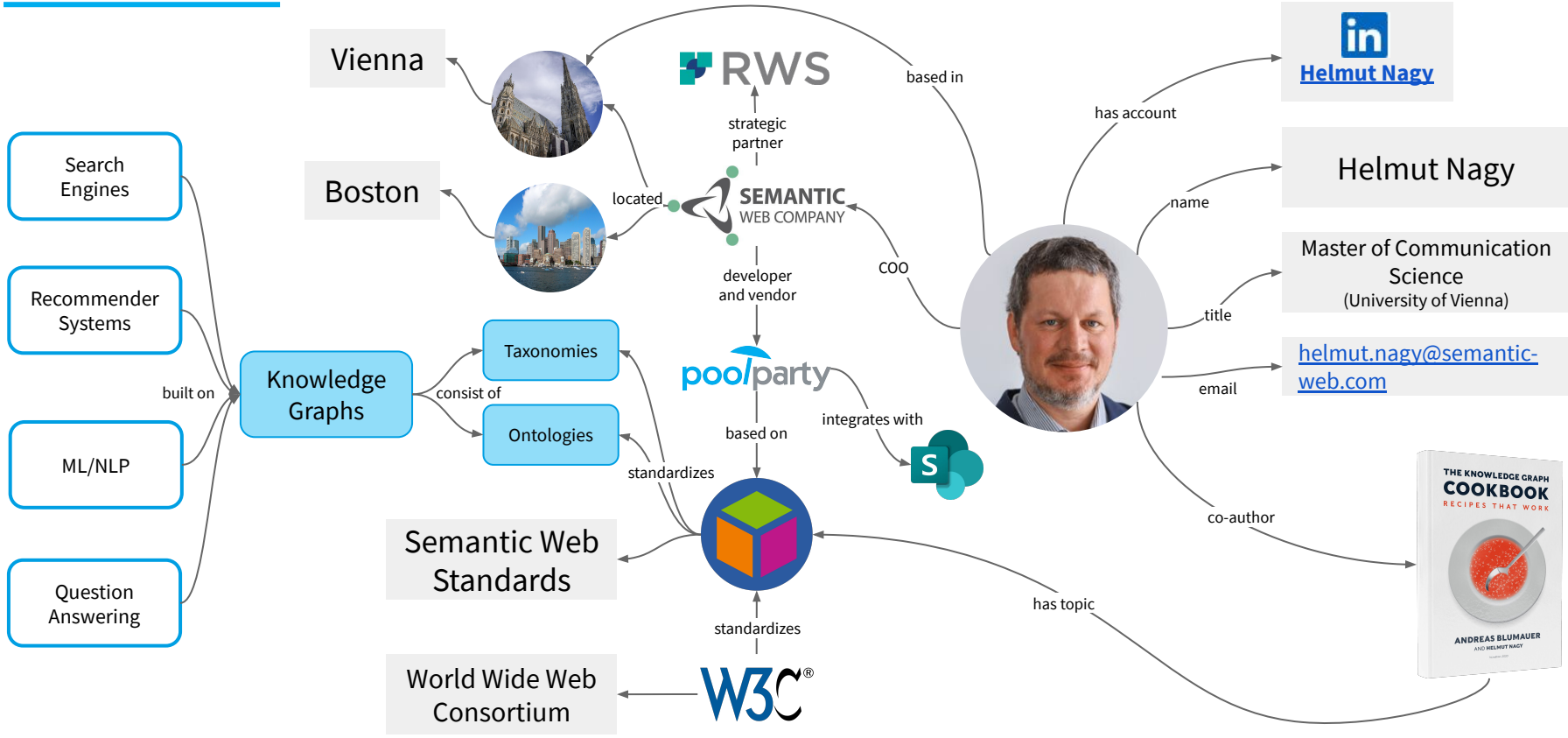
SEMANTIC WEB COMPANY

A Knowledge Graph Driven Recommender Engine

Recommender is the cornerstone of your Enterprise 360 strategy



Introduction




poolparty
Better decisions
Customer satisfaction
Knowledge discovery
New knowledge is created through the dynamic linking and contextualization of business objects.

Why Recommendation Systems (part 1)

Getting the right information to the right people

- There is a lot of information and content people can benefit from.
- They don’t know how best to look for information that would benefit them.
- They don't know that the information is there or how to find it.

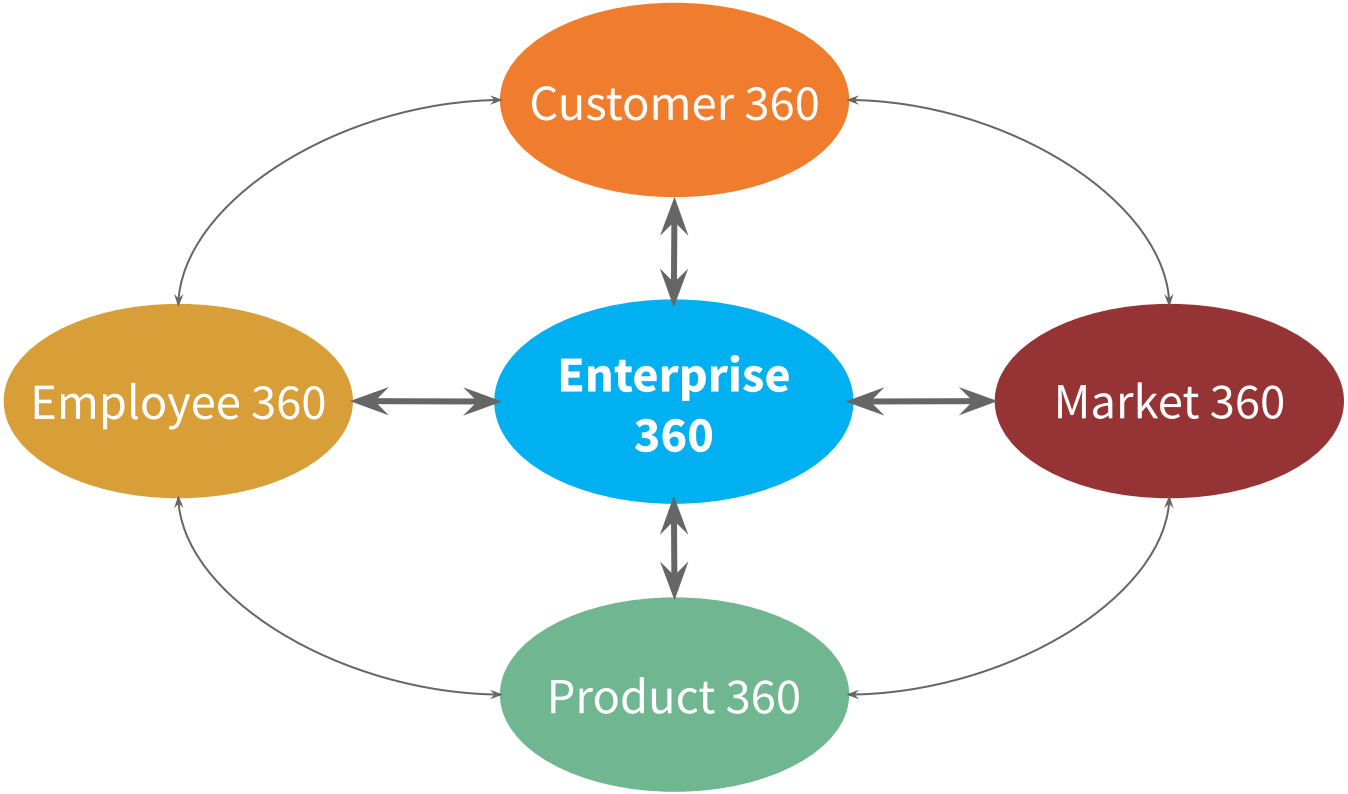
Making matches of what goes together

- Standard search does not support complex matching queries.
- Simply recommending what others have preferred before doesn't always work.

A system that provides **suggestions** or **recommendations** to users can be very helpful, not just in e-commerce environments.

Enterprise 360—the core of digital transformation

The key to successful digital transformation of any company is to be able to **dynamically generate comprehensive 360-degree views** of core processes and business objects.



Why Recommendation Systems (part 2)

Link all business objects together in a meaningful way. For example:

- Customers assemble individual products into bundles to meet their individual needs
- Employees find the most suitable job openings in the labor market
- Product features are identified as the most important to be better positioned in the marketplace
- Reuse knowledge from past projects and staff new projects with the right people
- Identify resolved tickets from the past that are similar to a current incident.

Challenge #1:

“Legacy companies make the mistake of treating recommendation engines as e-commerce sales and marketing gimmicks — another feature to add to the site — than as crucial investments in virtuous cycle platforms.”

Michael Schrage

Research fellow
at MIT Sloan School’s
Center for Digital Business

It’s not just about Collaborative Filtering...

Most recommender systems continue to be based on the basic principle of 'recommend *more of the same*', and in doing so cannot in any way 'understand' what really makes a good recommendation in a specific domain.

Types of Recommender Solutions (pt. 1)

- Collaborative Filtering
  - Item-item Collaborative Filtering
  - User-user Collaborative Filtering

→ Challenges
- Cold start problem: Needs a lot of data to create relevant suggestions.
- Filter bubbles leading to fake news and echo chambers.
- The choices made by these algorithms are not transparent.

Challenge #2:

Implementing a recommender system allows you to turn raw data into *personalized offers*.

Personalized offers result in higher customer satisfaction, but also in better decisions, and knowledge discovery.

One of our core hypotheses about recommenders at SWC.

Recommenders to help with configuration

Project: Evaluation of the current NLP system

In this project we want to evaluate the current state of NLP.

The following is a list of some of the most commonly researched tasks in natural language processing. Some of these tasks have direct real-world applications, while others more commonly serve as subtasks that are used to aid in solving larger tasks.

Short Description:

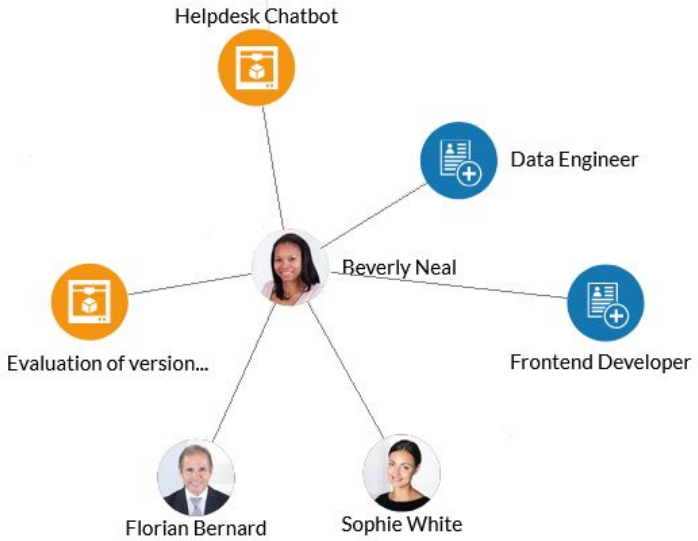
Separate words into individual morphemes and identify the class of the morphemes. The difficulty of this task depends greatly on the complexity of the morphology (i.e. the structure of words) of the language being considered.
English has fairly simple morphology, especially inflectional morphology, and thus it is often possible to ignore this task entirely and simply model all possible forms of a word (e.g. "open, opens, opened, opening") as separate words. In languages such as Turkish or Meitei, a highly agglutinated Indian language, however, such an approach is not possible, as each dictionary entry has thousands of possible word forms. Part-of-speech tagging is not necessarily key for precise text mining, which has to be evaluated.

Example: HR Recommender System

A semantic matchmaking tool based on a knowledge graph

Use case

- An organization wants to make the best use of the strengths and skills of its employees
- HR staff should be able to:
  - Find candidates for open positions
  - Staff projects
  - Identify professional development needs
- Employees should be able to:
  - Connect with interesting coworkers
  - Browse relevant projects
  - Find career opportunities within the organization



Types of Recommender Solutions (pt. 2)

- Content-Based Filtering

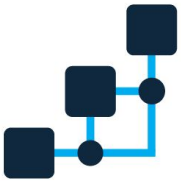
→ Challenges
  - Lack of background knowledge
  - Keywords based not considering any semantic relationships
  - Often restricted to one content source

Deep Dive: HR-Recommender

How the Semantic Knowledge Model was Built

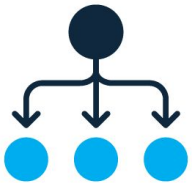
Taxonomy & Ontology for HR Recommender

Taxonomy created from multiple sources



- Fully developed taxonomies
  - ESCO (https://ec.europa.eu/esco)
  - SEMWEB custom created taxonomy
- Enrich the taxonomy with text mining (entity extraction)
  - Industry conference content: submitted papers, speakers
  - Fictitious CVs

Ontology layer to add semantic relationships



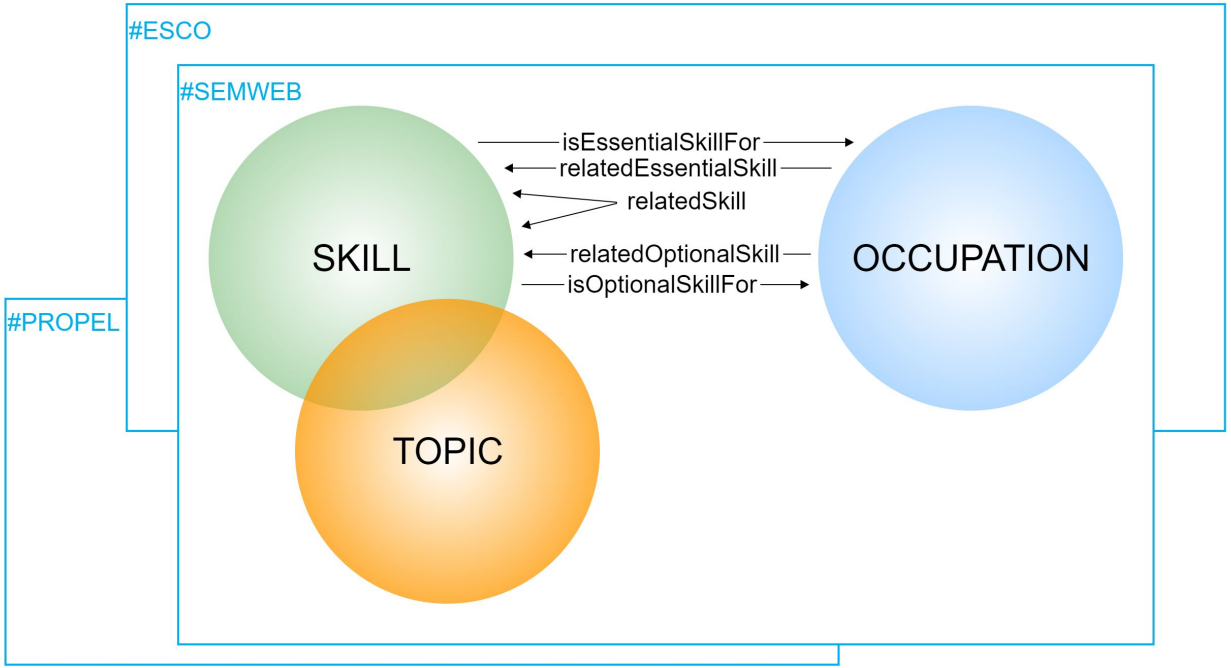
Deep Dive: HR-Recommender

How the Semantic Knowledge Model was Built

Taxonomy sources:

- Skills and Occupations: **ESCO** Classification
- Taxonomy enriched via corpus analysis adding more Topics: **Propel** corpus of industry conference content: submitted papers, speakers
- Skills , Occupations and Topics: **SEMWEB** custom taxonomy

Ontology layer:
Adding semantic relationships based on **ESCO**

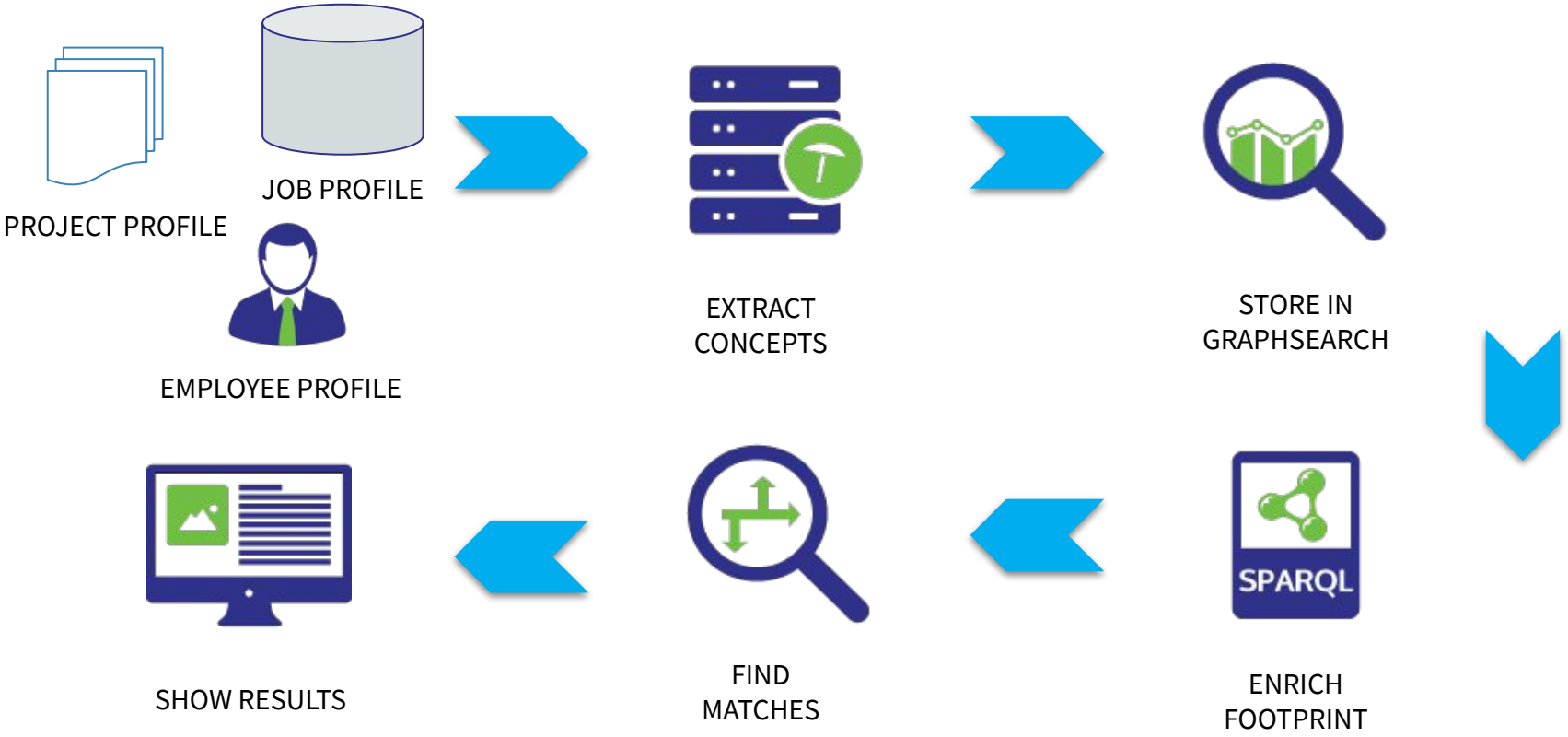


DEMO

https://hr-recommender.poolparty.biz/

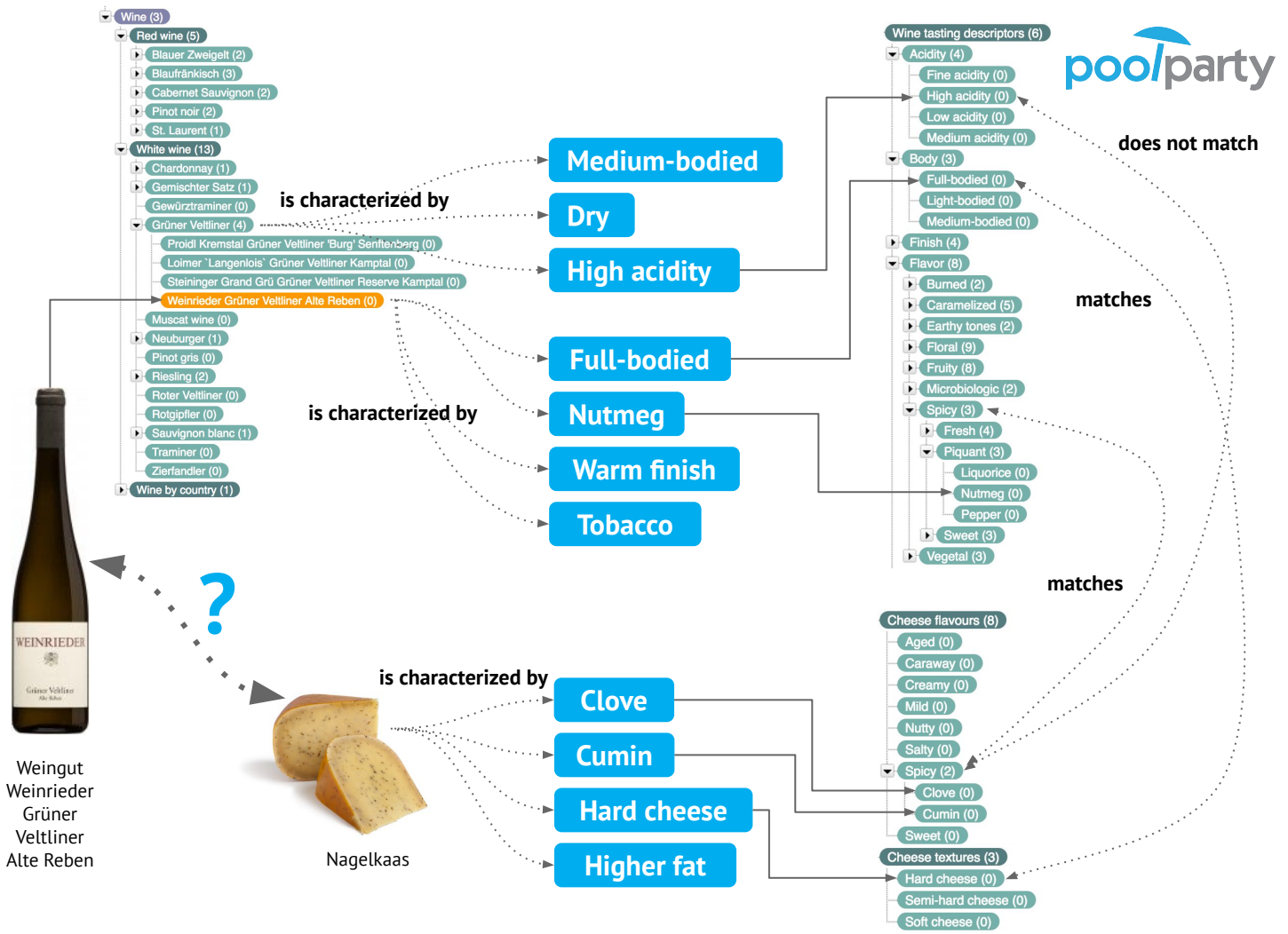
Deep Dive: HR-Recommender

How a Recommender System is Built



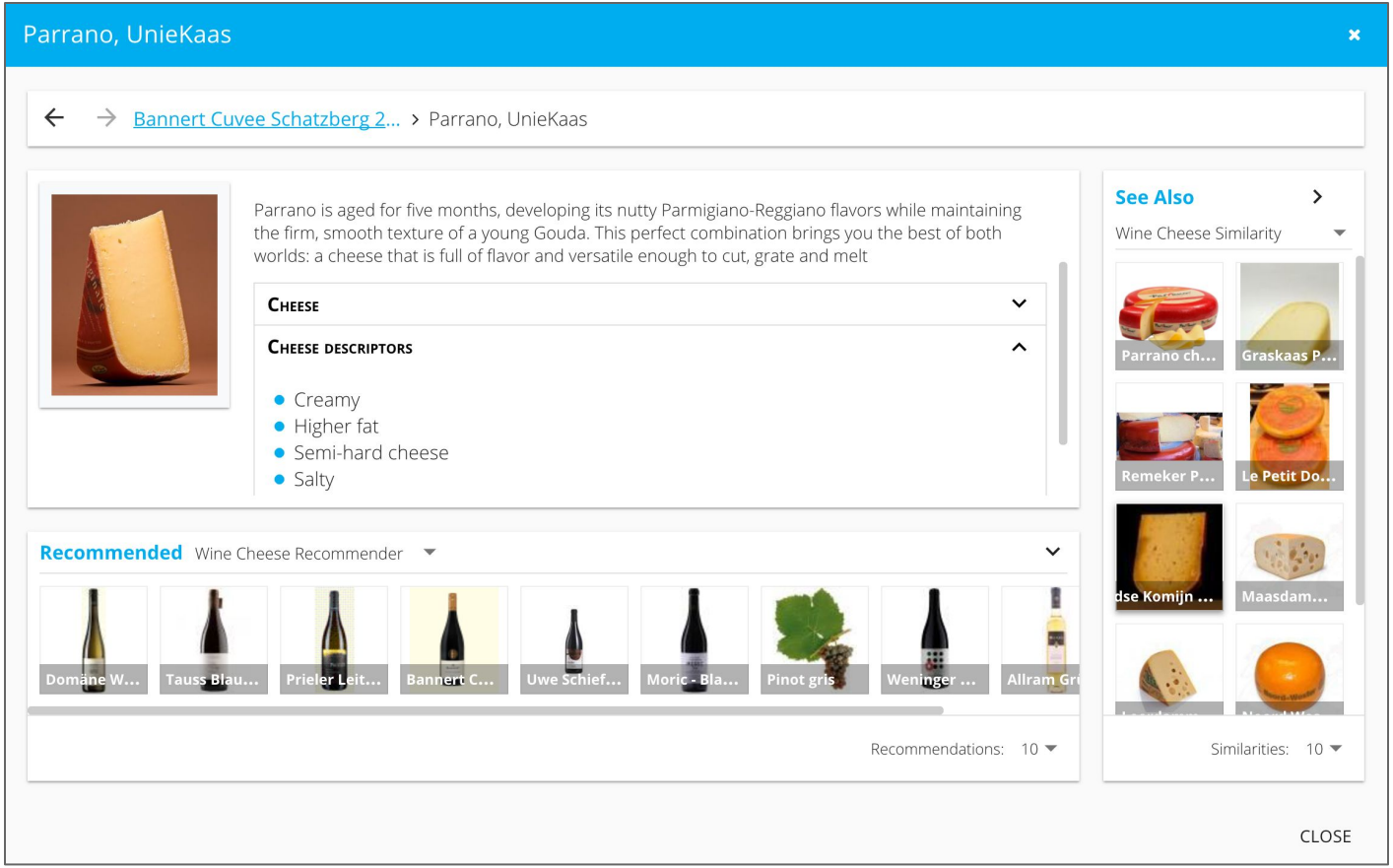
Wine & Cheese Pairing

Our approach
Knowledge Graph-based Recommender System making use of Semantic Web Standards



Wine & Cheese Pairing

The result
A precise, scalable and configurable recommender based on a domain-specific knowledge model

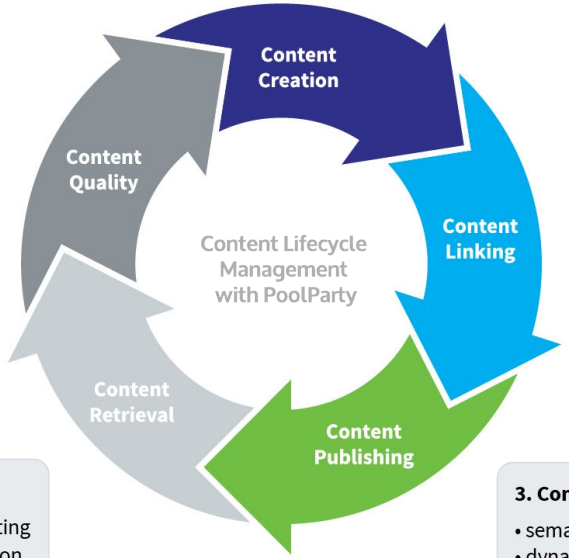


DEMO

https://vocabulary.semantic-web.at/GraphSearch/

Content Recommendation along the Life Cycle

1. Content Creation
- semi-automatic enrichment with metadata
- workflow management for different user roles
- content analytics



2. Content Linking
- semi-automatic content linking
- Integration of external sources
- Multimedia content recommendation

3. Content Publishing
- semantic annotation for SEO
- dynamic widgets / mash-ups
- visualization of content correlations

4. Content Retrieval
- classification & faceting
- search personalization
- push-services & alerts

5. Content Quality
- content reusage
- knowledge modelling
- sentiment analysis

Development steps towards **Enterprise 360°**

Crawl

- Taxonomies
- Ontologies
- Content types and structure

Walk

- Automatic Tagging
- Named Entity Recognition
- Semantic Footprinting

Run

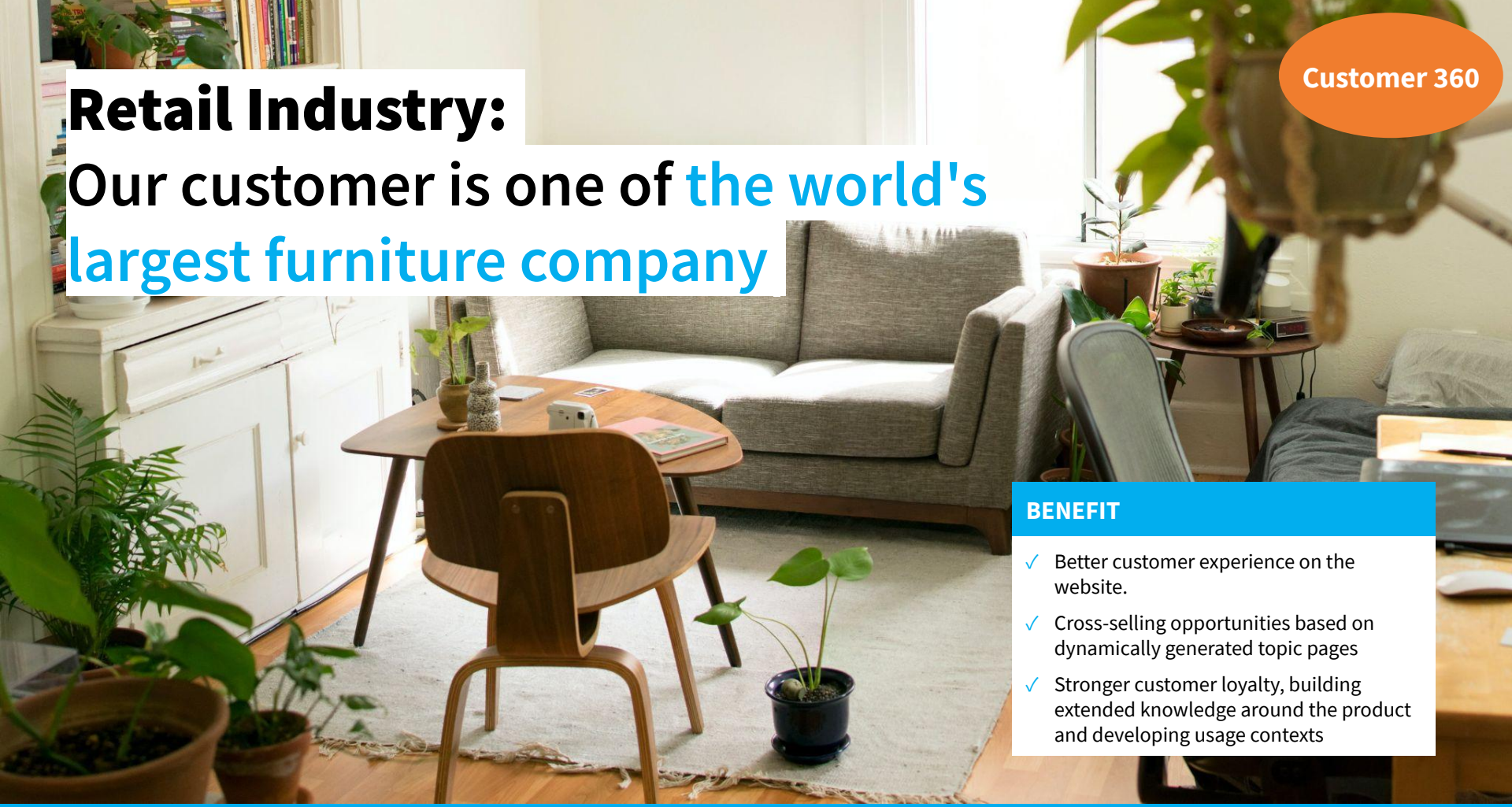
- Recommender Systems
- Semantic Search
- Question-answering

Fly

- Enterprise 360
- Knowledge Hub
- Enterprise Knowledge Graph

USE CASES

Learning from data-driven and content-driven use cases based on our customer success stories.



Customer 360

Retail Industry:

Our customer is one of the world's largest furniture company

BENEFIT

- ✓ Better customer experience on the website.
- ✓ Cross-selling opportunities based on dynamically generated topic pages
- ✓ Stronger customer loyalty, building extended knowledge around the product and developing usage contexts

Recommenders to help with configuration

Management consultancy:

Our customer is one of the most prestigious employers in the industry.

Employee 360

BENEFIT

- ✓ Increased competitiveness through better reuse of existing knowledge assets
- ✓ Improved analysis capabilities to identify existing gaps in the knowledge base
- ✓ Employee 360: Identification of missing skills in the company: Support for strategic HR planning

Product 360

Pharmaceutical Industry:

Our customer is one of the top 20 companies in the pharmaceutical industry.

BENEFIT

- ✓ Risks of becoming entangled in inconsistencies during a drug approval process are minimized.
- ✓ The time to successfully complete a drug approval is significantly reduced.

Did Dr Lehner do any drug research on polysorbates like ps 20 or ps 40?

Submit question

Be specific and imagine asking a question to another person.

Matched Tags: PS 20 × | PS 40 × | Polysorbate × | Drugs × | Lehnert, Dr., Dirk × | Add tag

Similar questions

P.7 Container Closure System:
It should be specified to which monograph do the Rubber Stopper part comply.

Please clarify the source of origin for Enzalutamide Cap 40mg (e.g. commercial product in UK)

It is unclear whether the MCB was tested for bovine and/or porcine viruses by in vitro assay. If no testing was performed the sponsor should discuss this point in respect to bovine serum albumin which was used as supplement of the SCB cryopreservation medium.

Associated Documents

The degradation of polysorbates 20 and 80 and its potential impact on the stability of biotherapeutics

Considerations for the Use of Polysorbates in Biopharmaceuticals

A Rapid High-Sensitivity Reversed-Phase Ultra High Performance Liquid Chromatography Mass Spectrometry Method for Assessing Polysorbate 20 Degradation in Protein Therapeutics

Associated experts

Lehnert, Dirk, Dr.

PS 20 | Antibiotics | Machine Learning

Beverly Neal, Dr.

PS 80 | Antibiotics | Drugs

Keith Ramos, Dr.

DNA | Drugs | Small Molecules | Bioprinting

Market 360

Healthcare:

Our customer is the main national public health information service in Australia

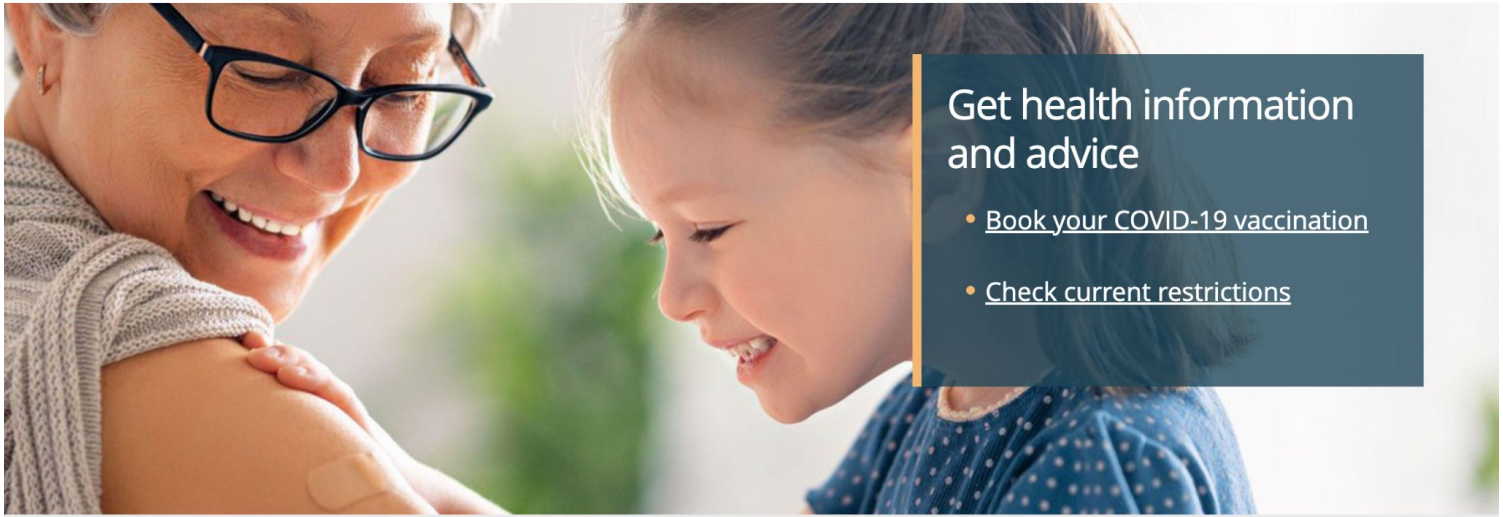
BENEFIT

- ✓ System makes quality-assured and linked medical information accessible to Australians in a user-friendly way.
- ✓ Content architects benefit from a graph-based approach making data management, and development of new services more agile.

healthdirect

Free Australian health advice you can count on.

Home | COVID-19 | Health topics A-Z | Medicines | Symptom checker | Service finder | Search our site



Check your symptoms | Find a health service | Find health information

Symptom checker

Abdominal pain

Colds and flu

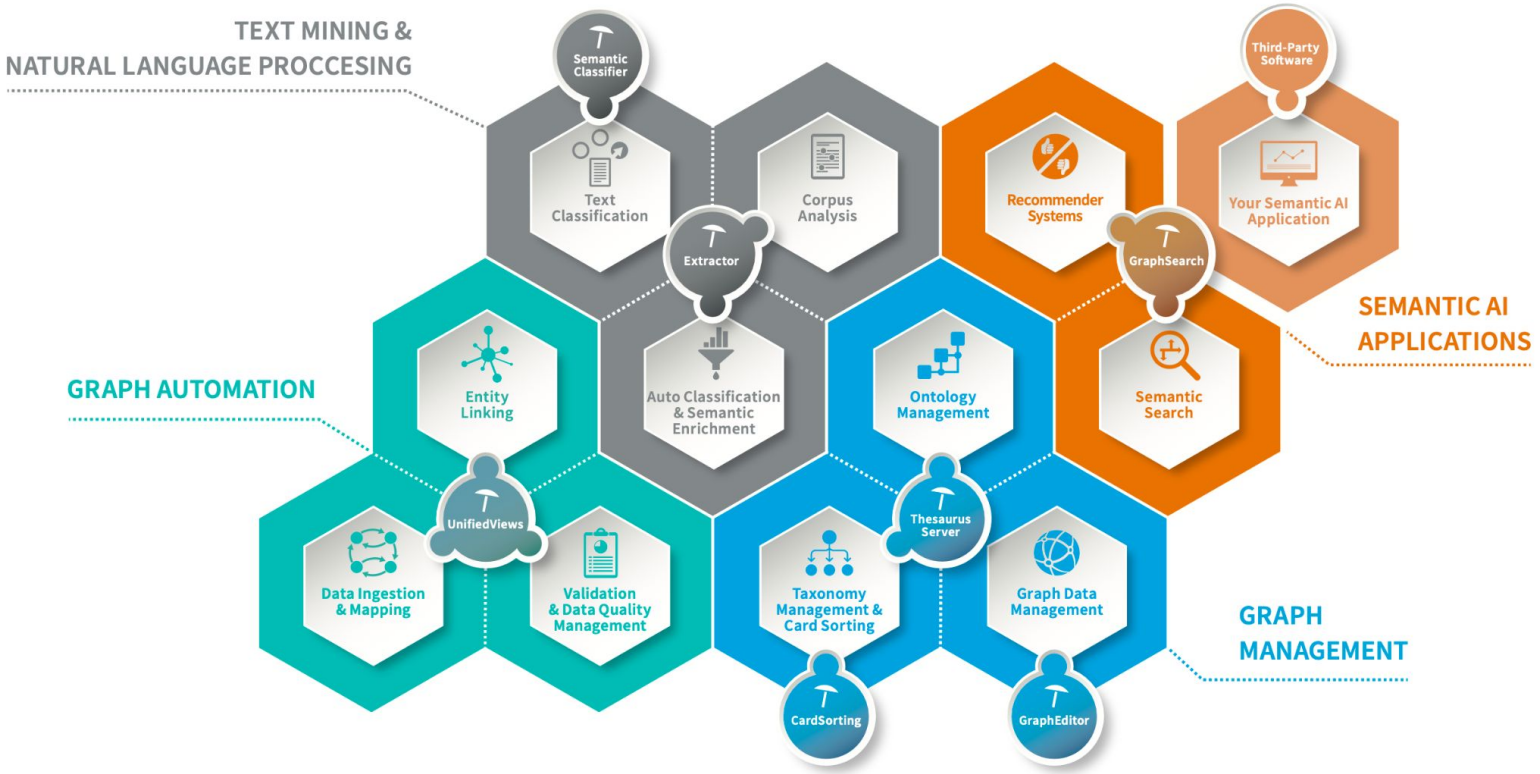
START SYMPTOM CHECKER

By 2023, graph technologies will facilitate rapid contextualization for decision making in 30% of organizations worldwide.

Gartner, Inc. (2020)

(Mark Beyer in “Graph Steps Onto the Main Stage of Data and Analytics: A Gartner Trend Insight Report”, December 2020)

PoolParty Platform—components and features



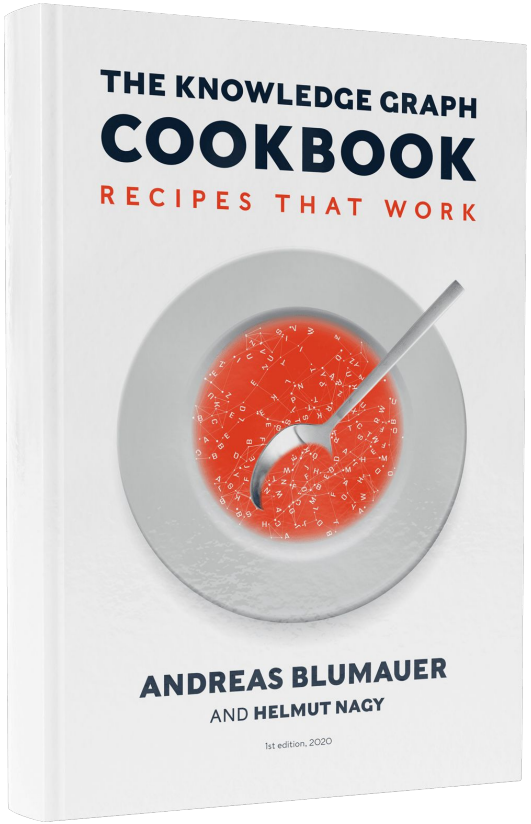
Why PoolParty?

- **The fastest semantic platform**
  Deep integration with leading graph databases
- **Fully standards-compliant**
  Future-proof investment &
  data portability
- **Secure Middleware approach**
  Easy integration based on
  comprehensive API and ISO 27001 certificate
- **Short learning curve**
  Outstanding user-friendliness & e-learning
- **Technological lead**
  Machine learning, NLP and knowledge graphs
- **Adapt to growing demands**
  Modular architecture & price model

Conclusion

- Recognize the challenges you face due to data silos and disconnected data in your organization
- Recognize the added value of data that is linked
- Link structured and unstructured data
- Align your data management with your knowledge management
- Start using graph technologies to create domain-specific knowledge models
- Start benefiting from precise and controllable recommender systems

The Knowledge Graph Cookbook—Facts and Figures



- 1st edition, published in April 2020
- Available in 3 versions
  - Free PDF
  - Kindle edition ($ 9.99 or kindleunlimited)
  - Paperback ($ 32.00)
- Based on more than 20 years of industry experience
- 256 pages (7 chapters + addendum)
- 49 infographics
- 177 bibliographic references
- 11 Expert interviews

Let’s talk!

Helmut Nagy

COO

www.linkedin.com/in/helmutnagy/

“

I am passionate about Knowledge Graphs, Semantic Technologies, and Agile Data Management.

Knowledge graphs built on top of semantic technologies, supported by machine learning technologies, can become a paradigm change in how we deal with metadata management. Active metadata is a key element to achieve this.